Vol. 1073 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

oute to:

PATENTS

December 9, 1986

U.S.
DEPARTMENT
OF COMMERCE

Patent
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PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 9, 1986 Volume 1073 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Sept. 30, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Dec. 6, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,418,431 through 4,419,770
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 21, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,349,932	06/254,450	9/21/82
4,349,934	06/234,985	9/21/82
4,349,960	06/218,277	9/21/82
4,349,961	06/306,752	9/21/82
4,349,963	06/223,080	9/21/82
4,349,975	06/240,845	9/21/82
4,349,984	06/233,493	9/21/82
4,349,989	06/246,602	9/21/82
4,350,005	06/285,266	9/21/82
4,350,016	06/236,523	9/21/82
4,350,042	06/223,990	9/21/82
4,350,067	06/261,007	9/21/82
4,350,070	06/238,005	9/21/82
4,350,080	06/216,802	9/21/82
4,350,085	06/217,997	9/21/82
4,350,087	06/245,869	9/21/82
4,350,110	06/221,157	9/21/82
4,350,117	06/239,416	9/21/82
4,350,142	06/222,633	9/21/82
4,350,195	06/235,925	9/21/82
4,350,199	06/231,651	9/21/82
4,350,201	06/224,035	9/21/82
4,350,341	06/274,823	9/21/82
4,350,344	06/235,783	9/21/82
4,350,417	06/241,287	9/21/82
4,350,423	06/281,892	9/21/82
4,350,425	06/260,281	9/21/82
4,350,445	06/216,774	9/21/82
4,350,483	06/226,499	9/21/82
4,350,488	06/278,834	9/21/82
4,350,493	06/248,625	9/21/82
4,350,545	06/264,954	9/21/82
4,350,553	06/287,424	9/21/82
4,350,562	06/274,883	9/21/82
4,350,568	06/254,305	9/21/82
4,350,569	06/265,476	9/21/82
4,350,584	06/242,408	9/21/82
4,350,590	06/237,937	9/21/82
4,350,596	06/266,201	9/21/82
4,350,610	06/252,592	9/21/82
4,350,617	06/255,568	9/21/82
4,350,623	06/236,064	9/21/82
4,350,646	06/265,654	9/21/82
4,350,650	06/219,964	9/21/82
4,350,660	06/263,912	9/21/82
4,350,662	06/227,285	9/21/82
4,350,668	06/246,065	9/21/82
4,350,689	06/322,789	9/21/82
4,350,703	06/222,282	9/21/82
4,350,712	06/233,153	9/21/82
4,350,722	06/241,646	9/21/82
4,350,762	06/231,152	9/21/82
4,350,769	06/282,679	9/21/82
4,350,775	06/300,302	9/21/82
4,350,781	06/286,419	9/21/82
4,350,782	06/302,400	9/21/82
4,350,824	06/236,484	9/21/82
4,350,837	06/233,465	9/21/82
4,350,890	06/215,596	9/21/82
4,350,931	06/223,397	9/21/82
4,350,968	06/229,422	9/21/82
4,350,995	06/255,982	9/21/82
4,351,020	06/247,643	9/21/82
4,351,046	06/237,873	9/21/82
4,351,048	06/297,053	9/21/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,856,513, Re. S.N. 922,290, Filed Oct. 23, 1986, Cl. 148/403, NOVEL AMORPHOUS METALS AND AMORPHOUS METAL ARTICLES, Ho-Sou Chen, et al., Owner of Record: *Inventor,* Attorney or Agent: James Riesenfeld, et al., Ex. Gp.: 111

4,243,546, Re. S.N. 854,220, Filed Apr. 21, 1986, Cl. 252/355, STABLE AQUEOUS COMPOSITIONS CONTAINING ENZYMES, Elias H. Shaer, Owner of Record: *Drackett Co., Cincinnati, Ohio,* Attorney or Agent: Prabodh I. Almaula, et al., Ex. Gp.: 223

4,348,081, Re. S.N. 897,066, Filed Aug. 15, 1986, Cl. 350/412, PROJECTION LENS, Ellis I. Betensky, Owner of Record: *U. S. Precision Lens, Cincinnati, Ohio,* Attorney or Agent: Peter L. Costas, et al., Ex. Gp.: 257

4,476,584, Re. S.N. 916,708, Filed Oct. 8, 1986, Cl. 455/182, DIGITAL FREQUENCY LOCK TUNING SYSTEM, Chuck Dages, Owner of Record: *Jerrold Electronics Corp., Hatboro, Pa.,* Attorney or Agent: Roy C. Hopgood, et al., Ex. Gp.: 263

4,476,799, Re. S.N. 919,233, Filed Oct. 15, 1986, Cl. 114/103, SAILS, Stephen D. Bandy, Owner of Record: *Inventor,* Attorney or Agent: Robert D. Lyon, et al., Ex. Gp.: 315

4,477,167, Re. S.N. 920,047, Filed Oct. 16, 1986, Cl. 354/400, PROTECTIVE DEVICE FOR AUTOMATIC FOCUSING CAMERA, Norio Ishikawa, et al., Owner of Record: *Minolta Camera Co., Osaka, Japan,* Attorney or Agent: Joseph W. Price, et al., Ex. Gp.: 211

4,477,607, Re. S.N. 918,820, Filed Oct. 14, 1986, Cl. 523/212, THIXOTROPIC CYANOACRYLATE COMPOSITIONS, Alan E. Litke, Owner of Record: *Loctite Corp., Newington, Conn.,* Attorney or Agent: Robert O. Vidas, et al., Ex. Gp.: 151

4,478,570, Re. S.N. 922,305, Filed Oct. 23, 1986, Cl. 431/344, FLOW CONTROL DEVICE FOR DISPOSABLE GAS LIGHTER, Stig Johansson, Owner of Record: *Feudor S.A., Rhone, France,* Attorney or Agent: Herbert Dubno, Ex. Gp.: 345

4,479,366, Re. S.N. 923,043, Filed Oct. 24, 1986, Cl. 62/304, EVAPORATIVE COOLER, Ted B. Lanier, et al., Owner of Record: *Tradewinds Technologies, Inc., Tempe, Ariz.,* Attorney or Agent: John W. Chestnut, Ex. Gp.: 344

4,500,724, Re. S.N. 911,614, Filed Sept. 25, 1986, Cl. 556/472, METHOD FOR MAKING ALKYLHALOSILANES, William J. Ward III, et al., Owner of Record: *General Electric Co., Waterford, N.Y.,* Attorney or Agent: William A. Teoli, Ex. Gp.: 124

4,512,907, Re. S.N. 918,140, Filed Oct. 14, 1986, Cl. 252/70, ICE MELTER AND METHOD OF MAKING SAME, Forrest M. McConnell, Owner of Record: *Koos, Inc., Kenosha, Wis.,* Attorney or Agent: John M. Mann, et al., Ex. Gp.: 157

4,539,020, Re. S.N. 922,323, Filed Oct. 23, 1986, Cl. 141/103, METHODS FOR OBTAINING HIGH-PURITY CARBON MONOXIDE, Toshikazu Sakuraya, et al., Owner of Record: *Kawasaki Steel Corp., Kyogo, Japan; Osaka Sanso Kogyo, Osaka, Japan,* Attorney or Agent: Alvin Browdy, et al., Ex. Gp.: 243

4,542,198, Re. S.N. 919,124, Filed Oct. 2, 1986, Cl. 526/125, POLYMERIZATION CATALYSTS, Adolfo Mayr, et al., Owner of Record: *Inventor,* Attorney or Agent: Patricia Q. Peake, et al., Ex. Gp.: 155

4,587,459, Re. S.N. 916,992, Filed Oct. 2, 1986, Cl. 315/158, LIGHT-SENSING LIGHT FIXTURE CONTROL SYSTEM, Frederick H. Blake, Owner of Record: *Inventor,* Attorney or Agent: Bruce A. Kaser, et al., Ex. Gp.: 266

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,760,669, Reexam. No. 90/001,113, Requested: Oct. 10, 1986, Cl. 83/208, SHEET MATERIAL FEEDING AND CUTTING APPARATUS AND CONTROL SYSTEM THEREFOR, Ben J. Rosenthal, et al., Owner of Record: *Rosenthal Mftg. Co., Inc., Chicago, Ill.,* Attorney or Agent: None, Ex. Gp.: 320, Requester: Thermal Equipment, Inc., Goddard, Kans.

3,794,732, Reexam. No. 90/001,104, Requested: Oct. 3, 1986, Cl. 514/460, RUMINANT FEED UTILIZATION IMPROVEMENT, Arthur P. Raun, Owner of Record: *Eli Lilly & Co., Indianapolis, Ind.,* Attorney or Agent: Finnegan, Henderson, et al., Ex. Gp.: 120, Requester: Hoffmann-Laroche, Inc., Nutley, N.J.

3,979,709, Reexam. No. 90/001,116, Requested: Oct. 20, 1986, Cl. 337/186, ELECTRIC FUSE HAVING A MULTIPLY CASING OF A SYNTHETIC RESIN GLASS CLOTH LAMINATE, Daniel P. Healey, Owner of Record: *Gould, Inc., Rolling Meadow, Ill.,* Attorney or Agent: Paul Edgell, Ex. Gp.: 210, Requester: Owner

4,102,933, Reexam. No. 90/001,108, Requested: Oct. 6, 1986, Cl. 568/648, PROCESS FOR PREPARING A STRIALKOXY BENZENE, Barrie D. Howarth, et al., Owner of Record: *Oce-Andeno B.V., Venlo, Weg, The Netherlands,* Attorney or Agent: Reed, Smith, et al., Ex. Gp.: 120, Requester: Owner

4,104,822, Reexam. No. 90/001,118, Requested: Oct. 23, 1986, Cl. 46/74, ROTATING CIRCULAR AIRFOIL, Henry Wendell Rodgers, Owner of Record: *Inventor, Lakewood, Colo.,* Attorney or Agent: Greg J. Anderson, Ex. Gp.: 330, Requester: Alan J. Adler, Palo Alto, Calif.

4,236,078, Reexam. No. 90/001,117, Requested: Oct. 16, 1986, Cl. 250/484, METHOD AND APPARATUS FOR RECORDING AND REPRODUCING A RADIATION IMAGE, Noboru Kotera, et al., Owner of Record: *Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan,* Attorney or Agent: Gerald J. Ferguson, Ex. Gp.: 250, Requester: Owner

4,238,799, Reexam. No. 90/001,109, Requested: Oct. 6, 1986, Cl. 343/715, WINDSHIELD MOUNTED HALF-WAVE COMMUNICATION ANTENNA ASSEMBLY, Dale R. Parfitt, Owner of Record: *Orion Industries, Inc., Wilmington, Del.,* Attorney or Agent: Dressler, Goldsmith, et al., Ex. Gp.: 250, Requester: Charles T. McCrink, Rancho Santa Fe, Calif.

4,351,753, Reexam. No. 90/001,112, Requested: Oct. 6, 1986, Cl. 252/357, LIQUIFIED NORMALLY SOLID POLYOXALKYLENE BLOCK POLYMERS, Thomas M. Kaneko, Owner of Record: *B.A.S.F. Wyandotte Corp., Wyandotte, Mich.,* Attorney or Agent: Bernard R. Swick, Ex. Gp.: 150, Requester: John J. McDonnell, Chicago, Ill.

4,422,338, Reexam. No. 90/001,115, Requested: Oct. 14, 1986, Cl. 73/861, METHOD AND APPARATUS FOR MASS FLOW MEASUREMENT, James E. Smith, Owner of Record: *Micro Motion, Inc., Boulder, Colo.,* Attorney or Agent: Mary Helen Sears, Ex. Gp.: 260, Requester: Exac Corp., Campbell, Calif.

4,439,311, Reexam. No. 90/001,110, Requested: Oct. 6, 1986, Cl. 208/179, REREFINING USED LUBRICATING OIL WITH HYDRIDE REDUCING AGENTS, Richard H. O'Blasny, Owner of Record: *Delta Central Refining, Inc., Natchitoches, La.,* Attorney or Agent: Jenner & Block, Ex. Gp.: 110, Requester: Wayne E. Nacker, Chicago, Ill.

4,486,944, Reexam. No. 90/001,107, Requested: Oct. 3, 1986, Cl. 29/557, METHOD OF MAKING SINGLE POLY MEMORY CELL, Kim C. Hardee, Owner of Record: *Inmos Corp., Colorado Springs, Colo.,* Attorney or Agent: Edward D. Manzo, Ex. Gp.: 110, Requester: Owner

4,504,383, Reexam. No. 90/001,111, Requested: Oct. 6, 1986, Cl. 208/179, REREFINING USED OIL WITH BOROHYDRIDE REDUCING AGENTS, Richard H. O'Blasny, Owner of Record: *Delta Central Refining, Inc., Natchitoches, La.,* Attorney or Agent: Jenner & Block, Ex. Gp.: 110, Requester: Wayne E. Nacker, Chicago, Ill.

4,551,930, Reexam. No. 90/001,106, Requested: Oct. 2, 1986, Cl. 36/30, SOLE CONSTRUCTION FOR FOOTWEAR, Kenneth W. Graham, et al., Owner of Record: *New Balance Athletic Shoes, Inc., Boston, Mass.,* Attorney or Agent: Pennie & Edmonds, Ex. Gp.: 240, Requester: Owner

4,558,179, Reexam. No. 90/001,105, Requested: Sept. 30, 1986, Cl. 179/630, MESSAGE PLAYBACK CONTROL SYSTEM FOR TELEPHONE ANSWERING MACHINE, Raymond G. Bond, Owner of Record: *Fortel, Inc., Compton, Calif.,* Attorney or Agent: Jessup & Beecher, Ex. Gp.: 260, Requester: Chittaranjan Nirmel, Alexandria, Va.

4,575,123, Reexam. No. 90/001,114, Requested: Oct. 10, 1986, Cl. 281/48, REPORT COVER, John P. Giblin, Owner of Record: *Champion International Corp., Stamford, Conn.,* Attorney or Agent: Evelyn M. Sommers, Ex. Gp.: 320, Requester: Barry D. Josephs, Framingham, Mass.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Earl C. Recker, d/b/a Earl C. Recker Co., assignee, by mesne assignment, of Recker-Best Co., Mesa, Ariz., Reg. No. 308,133, for the mark "GOLD RUSH", Canc. No. 15,416.

Walter Holder, d/b/a Holder Chemical Co., assignee of Joseph H. James, Ponca City, Okla., Reg. No. 618,453, for the mark "JAMES 'PERMA-KILL' AND DESIGN", Canc. No. 15,632.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for licenses may be addressed to: Patent Counsel Turbine Legal Operations, 1 River Rd., Schenectady, N.Y. 12345.

4,537,560. * RADIAL KEY FOR STEAM TURBINE WHEELS.
4,538,455. * METHOD AND APPARATUS FOR AXIALLY ALIGNING THE COUPLED SHAFTS OF A STEAM TURBINE.
4,567,914. * TWO-STAGE HYDRAULIC SOLENOID VALVE.
4,551,017. * LASER DOPPLER VELOCIMETER FOR MEASURING TORSIONAL VIBRATION.
4,551,018. * ACOUSTIC EMISSION ANALYZER.

The patents for the inventions listed below and owned by the estate of Rome Rudolph, are available for licensing or sale.

Please contact Attorney Edward L. Flaherty, Jr., 5916 Penn Mall, Pittsburgh, Pa. 15206

3,820,411. * IN LINE, POSITIVE DRIVE, INDEXING UNIT.
3,835,716. * GEARLESS INTERMITTENT MOTION DEVICE.
4,427,399. * OVERLOAD COUPLING OR CLUTCH.
4,452,093. * DRIVE UNIT.

SN. 4,231,061. * INSTANT COLOR SLIDE RECORDER OF CRT IMAGE. *Sammuel Freeman,* 13 Birchwood Ct. East, Syosset, N.Y. 11791.
SN. 06,690,888. * ROTARY INTERNAL COMBUSTION ENGINE, *Joseph F. Frasca,* 5801 Yorkstown Rd., Lorain, Ohio 44053.
SN. 06,780,963. * PNEUMATIC GAS CYLINDER VALVE ACTIVATOR. *Joseph F. Long,* 603 W. 13 St., Austin, Tex. 78701.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 9, 1986

Re. 32,091	4,553,732	4,587,424	4,604,096
4,255,677	4,554,495	4,588,683	4,604,426
4,360,542	4,554,635	4,589,517	4,605,339
4,407,410	4,555,523	4,589,770	4,605,370
4,412,648	4,559,859	4,590,855	4,605,394
4,420,624	4,560,587	4,592,869	4,605,521
4,443,631	4,560,720	4,593,598	4,605,718
4,471,378	4,564,921	4,593,822	4,605,719
4,488,948	4,568,658	4,594,010	4,605,764
4,490,363	4,569,111	4,594,346	4,606,869
4,500,621	4,570,640	4,594,858	4,607,096
4,504,930	4,570,673	4,596,426	4,607,173
4,515,785	4,570,929	4,596,462	4,607,238
4,525,281	4,575,040	4,596,643	4,607,915
4,532,054	4,575,414	4,596,812	4,608,386
4,532,198	4,575,709	4,599,022	4,608,640
4,532,655	4,576,972	4,599,216	4,608,642
4,536,460	4,578,466	4,599,239	4,609,884
4,537,981	4,579,653	4,599,273	4,610,228
4,538,182	4,579,911	4,599,687	4,610,428
4,538,622	4,580,644	4,599,926	4,610,739
4,540,129	4,581,389	4,600,543	4,610,991
4,540,933	4,582,685	4,600,906	4,611,348
4,542,155	4,582,888	4,600,930	4,612,057
4,544,440	4,583,063	4,601,127	4,612,857
4,549,091	4,584,419	4,601,769	4,613,633
4,550,708	4,584,507	4,601,975	4,614,216
4,551,405	4,585,123	4,602,037	4,615,777
4,551,645	4,586,242	4,603,203	
4,552,159	4,586,431	4,603,284	
4,552,961	4,587,358	4,603,401	

Disclaimers

4,483,016.—*Peter A. Hochstein,* Sterling Heights, and *Kelvin Shih,* Brighton, Mich. AUDIO AMPLIFIER. Patent dated Nov. 13, 1984. Disclaimer filed Oct. 6, 1986, by the *inventors.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,536,449.—*Peter Kennedy,* Broughton and *Kenneth Parkinson,* Wirral, United Kingdom. REACTION BONDED SILICON CARBIDE ARTEFACTS. Patent dated Aug. 20, 1985. Disclaimer filed Sept. 24, 1986, by the assignee, *United Kingdom Atomic Energy Authority.*

Hereby enters this disclaimer to claim 1 of said patent.

4,541,819.—*Philip J. Mazziotti,* Toledo, Ohio. UNIVERSAL JOINT EMPLOYING BEARING ROLLERS. Patent dated Sept. 17, 1985. Disclaimer filed Oct. 17, 1986, by the assignee, *The Zeller Corp.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 8, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-07-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-29-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-12-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-21-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-25-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during November 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,475,765 to 3,480,965, inclusive

Plant Patents ..... Numbers 2,937 to 2,944 inclusive

REISSUES

DECEMBER 9, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,301

METHOD AND APPARATUS FOR CONTROLLING THE COMPOSITION OF THE COMBUSTIBLE MIXTURE OF AN ENGINE

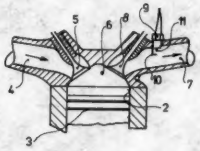
Reinhard Latsch, Vaihingen, and Valerio Bianchi, Hochdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Original No. 4,372,270, dated Feb. 8, 1983, Ser. No. 747,676, Dec. 6, 1976. Application for reissue Jul. 1, 1983, Ser. No. 510,455

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2554988

Int. Cl.[4] F02B *3/00*

U.S. Cl. 123—440 **25 Claims**



1. A method for controlling the fuel-air mixture of an internal combustion engine, said engine including combustion chambers, inlet conduits leading to said combustion chambers and exhaust conduits leading from said combustion chambers to the atmosphere, comprising the steps of

placing an ion-current sensor in the exhaust conduit for measuring an ion-current;

generating a nominal value of the ion-current;

periodically integrating the measured values of the ion-current during one working cycle of a piston of the engine,

comparing the [magnitude] *values* of the *integrated* ion-current with [the] *said* nominal value and generating a signal representing the difference between the measured value of the ion-current and said nominal value; and

[periodically integrating a signal derived from the signal representing the difference between the measured value of the ion-current and said nominal value, especially during one working cycle of a piston of the engine, and]

altering the fuel-air mixture of the engine in dependence on the result of [the integration] *said comparison.*

Re. 32,302

FRACTURING METHOD FOR STIMULATION OF WELLS UTILIZING CARBON DIOXIDE BASED FLUIDS

Stephen W. Almond, Ventura, Calif., and Phillip C. Harris, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Original No. 4,480,696, dated Nov. 6, 1984, Ser. No. 436,763, Oct. 25, 1982. Application for reissue Aug. 6, 1985, Ser. No. 763,121

Int. Cl.[4] E21B *43/267*

U.S. Cl. 166—308 **49 Claims**

1. A method of fracturing a subterranean formation penetrated by a well bore comprising:

admixing an aqueous liquid with liquid carbon dioxide and a selected surfactant comprising at least one member selected from the group consisting of alkyl quaternary amines, betaines, sulfated alkoxylates and ethoxylated linear alcohols to form a stabilized emulsion, said emulsion comprising *an amount of liquid carbon dioxide whereby upon conversion of said liquid carbon dioxide to a gas and said emulsion to a foam, said foam contains* from about [50] *53* to in excess of about 96 percent by per volume carbon dioxide and said surfactant being present in said emulsion in an amount sufficient to stabilize said emulsion;

introducing said emulsion into said well bore penetrating said subterranean formation at a temperature below the critical temperature of carbon dioxide and under sufficient pressure to maintain the carbon dioxide as a liquid;

maintaining said emulsion within said formation for a sufficient time to permit said emulsion to be heated to a temperature above the critical temperature of carbon dioxide to form a stabilized foam from said emulsion, said foam having a viscosity immediately after formation which is substantially the same as the viscosity of the emulsion; and

fracturing said subterranean formation with said foam.

Re. 32,303

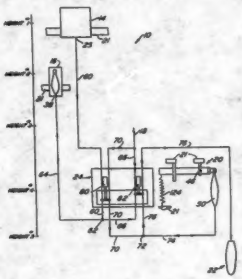
PERITONEAL DIALYSIS APPARATUS

Norman Lasker, Philadelphia, Pa., and Bruce E. Jarrell, Richmond, Va., assignors to American Medical Products Corp., Freehold, N.J.

Original No. 3,872,863, dated Mar. 25, 1975, Ser. No. 384,316, Jul. 31, 1973. Application for reissue Mar. 24, 1977, Ser. No. 781,031

Int. Cl.[4] A61M *5/00, 1/03*

U.S. Cl. 604—29 **11 Claims**



1. A dialysis apparatus comprising first means for supplying dialysis fluid, second means for measuring a predetermined quantity of dialysis fluid, a catheter, third means for detecting a minimum quantity of dialysis fluid, means for supporting said first means above said second means, said second means above said catheter, and said third means below said catheter so that dialysis fluid moves through said apparatus under the force of gravity, fluid flow conduits interconnected between said first and second means[,] *and between* said second means and said catheter and *between* said catheter [in] *and* said third means, fourth means *including a single actuator for plural valves* for *simultaneously* regulating the flow of dialysis fluid [and] *in* said [conduits] *conduit* between said first and second means and *the conduit between* said catheter and said third means *in a manner so that flow is simultaneously on or off,* fifth means *including a single actuator for plural valves* for *simultaneously* regulating the flow of dialysis fluid *in the conduit* between said second means and said catheter[,] and *a conduit* from said third means *in a manner so that flow is simultaneously on or off,* and means for controlling said *actuators for said* fourth and fifth means to alternately permit flow of dialysis fluid in the conduits regulated thereby so that the dialysis fluid is permitted to flow through said apparatus and a patient and then from said third means.

PLANT PATENTS

GRANTED DECEMBER 9, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,820

RUIMEVA ROSE PLANT

Gijsbert DeRuiter, Hazerwoude, Netherlands, assignor to Carlton Rose Nurseries, Carlton, Oreg.

Filed Jan. 18, 1985, Ser. No. 692,503

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea Class obtained as a seedling from a seed parent of the Varlon class and a pollen parent of the Meigerion variety, characterized by its vigorous growth, its orange-red color, its ability to yield on a continuous basis in a greenhouse large long lasting blooms which maintain true color after being cut from bud through petal drop, substantially as shown and described.

5,821

PEACH TREE (WHITE LADY)

Chris F. Zaiger, 537 Rosemore Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Feb. 4, 1985, Ser. No. 697,871

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—42 **1 Claim**

1. A new and distinct variety of peach tree which is of large size, vigorous, upright in growth and a regular and productive bearer of large, very firm, white flesh, freestone fruit with very good eating quality; the fruit is further characterized by coloring 7 to 10 days before maturity and having more attractive red skin color than most other white fleshed commercial varieties.

5,822

GRAPEVINE NAMED ISON

Bill Ison, Rte. 1, Brooks, Ga. 30205

Filed Nov. 9, 1984, Ser. No. 670,051

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—47 **1 Claim**

1. The new and distinct variety of the specified plant as described and illustrated.

5,823

GRANNY VAL GRAPEVINE

Bill Ison, Rte. 1, Brooks, Ga. 30205

Filed Nov. 9, 1984, Ser. No. 670,052

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—47 **1 Claim**

1. The new and distinct variety of the specified plant as described and illustrated.

5,824

GRAPEVINE NAMED BLACK FRY

Bill Ison, Rte. 1, Brooks, Ga. 30205

Filed Nov. 9, 1984, Ser. No. 670,053

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—47 **1 Claim**

1. The new and distinct variety of the specified plant as described and illustrated.

5,825

KALANCHOE PLANT NAMED STROMBOLI

Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Ball Panam Plant Company, Parris, Fla.

Filed Feb. 28, 1985, Ser. No. 706,594

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe named Stromboli, as described and illustrated, and particularly characterized by its red flower color, strong growth and freely branching habit, high floriferousness, relatively short crop time, and adaptability for production in pots of varying diameter.

5,826

KALANCHOE PLANT NAMED ETNA

Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Ball Panam Plant Company, Parrish, Fla.

Filed Feb. 28, 1985, Ser. No. 706,606

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe named Etna, as described and illustrated, and particularly characterized by its large orange-red flowers, floriferous habit, medium growth habit, an average 12 weeks crop time, and by its adaptability to pots of varying size.

PATENTS

GRANTED DEC. 9, 1986

ERRATA

For CLASS	See PATENT NO.
379-051	4,628,152
379-163	4,628,153
381-189	4,628,154
381-156	4,628,155
379-410	4,628,156
379-410	4,628,157
379-010	4,628,158
358-010	4,628,342
366-265	4,628,391
363-134	4,628,438
364-167	4,628,499

PATENTS

GRANTED DECEMBER 9, 1986

GENERAL AND MECHANICAL

4,627,108
KNEE AND SHIN PROTECTOR
Jyrki H. Järvinen, Vaasa, Finland, assignor to Yoko-team Oy, Forssa, Finland
Filed Nov. 21, 1984, Ser. No. 673,949
Claims priority, application Finland, Dec. 29, 1983, 834838
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—22 **2 Claims**

1. A knee and shin protector providing a two-piece outer shield and a separate padding layer fitted in, and serving to join said two-piece shield together, comprising

a molded plastic shin guard comprising one piece of said outer shield,

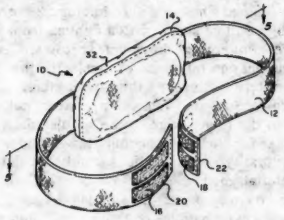
a separate molded plastic knee guard comprising the second piece of said outer shield,

each piece of said shield being defined by outer edges and having a plurality of integral lugs spaced away from outer edges of said shield and defined by cut-out portions leaving only an integral attachment portion, and

a single padding member larger in area than the total area of said outer shield and having a plurality of notches, each receiving one of said lugs therethrough,

so that said single padding member is united to said two shield pieces by said lugs and notches.

4,627,109
LUMBOSACRAL SUPPORT
Robert A. Carabelli, Cherry Hill Medical Arts Bldg., 7740 Maple Ave., Pennsauken, N.J. 08109, and Allan G. Edmund, Ocean City, N.J., assignors to Robert A. Carabelli, Philadelphia, Pa.
Filed Oct. 4, 1985, Ser. No. 784,337
Int. Cl.[4] A61F *5/02*
U.S. Cl. 2—44 **9 Claims**



1. A lumbosacral support comprising:

a belt adapted to be worn around a person's waist and including means adjacent the ends thereof for connecting said ends together;

a fabric-covered foam pad carried by said belt intermediate the ends thereof so that said pad is positioned only against a person's lower back when said belt is being worn;

said pad having a vertically extending trough-like groove cut away from the central portion thereof, said groove extending throughout the height of said pad but only partially through the thickness thereof and being positioned such that when said belt is worn, said groove directly overlies and is in substantial alignment with the person's spine whereby when said person presses against a seat back, said foam pad puts pressure on the supporting lumbosacral musculature on either side of the spine but does not put pressure directly on the spinal column.

4,627,110
ARTICLE OF WEARING APPAREL WITH AN ERASABLE WRITING SURFACE
Anthony M. Tengs, P.O. Box 45008, Seattle, Wash. 98145
Filed Oct. 17, 1983, Ser. No. 542,270
Int. Cl.[4] A41D *1/00, 27/08*
U.S. Cl. 2—69 **16 Claims**

1. A garment comprising:

an article of wearing apparel for covering the torso of a human body, said article of wearing apparel having a writing surface provided on a torso covering exterior portion thereof that is readily observable by others when the article of wearing apparel is worn by a user, said writing surface forming a permanent portion of said article of wearing apparel, said article of wearing apparel also having permanent writing provided on said torso covering exterior portion thereof adjacent to said writing surface, said permanent writing being predeterminedly positioned with respect to said writing surface; and

writing means for writing on said writing surface,

said writing surface and said writing means being comprised of materials which allow a user to write on, and remove writing from said writing surface.

13. Apparatus for creating a message bearing garment suitable for covering the torso of a human body, said apparatus comprising:

an article of wearing apparel for covering the torso of a human body, said article of wearing apparel having a writing surface on the exterior of the torso covering portion thereof that is readily observable by others when the article of wearing apparel is worn by a user, said writing surface forming a permanent portion of said article of wearing apparel, said writing surface being formed of a material to which an elastomeric sealant will adhere to and be peelable away from without damage to said writing surface; and,

elastomeric sealant writing means for creating a stable viewable image on said writing surface, said elastomeric sealant

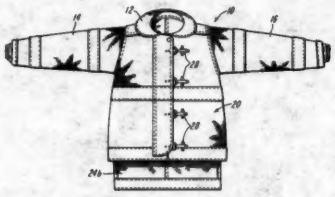
being formed of an adhesive caulking compound that sets from a flowable application phase to a dry semihard phase at room temperature, said adhesive caulking compound being adhesively attachable to said writing surface when in said flowable application phase and manually peelable away from said writing surface when in said dry semihard phase.

4,627,111
BODY SUIT
Lyndola M. Storie, 1739 Cherokee, Caseyville, Ill. 62232
Filed Aug. 22, 1985, Ser. No. 768,236
Int. Cl.[4] A41B *1/12*
U.S. Cl. 2—69 2 Claims

1. A body suit for enclosing and completely covering the torso area of a female human wearer in skintight relation comprising a torso enclosing member consisting only of a front panel and a rear panel of integral construction and provided with shoulder engaging regions, a neck opening, arm openings and a crotch area with leg openings, said torso enclosing member being constructed of thin, flexible porous resilient material having external appearance, surface texture, feel and shape characteristics closely simulative of ideal physical appearance, shape and size characteristics of a natural torso of a female human body with the body suit covering unsightly body areas such as stretch marks, scars, moles and the like, said front panel including pockets receiving the natural breasts, if present, and breast prostheses to provide replacement breasts in the event of mastectomies or enhance breast size and shape, said crotch area including an opening extending longitudinally from front to rear to enable normal body functions to be performed including coital intercourse while the body suit is being worn without requiring removal of any garments, said torso enclosing member including a simulative navel in the front panel and simulated pubic hair in the crotch area and front panel to provide all of the appearance characteristics of a natural naked human female body.

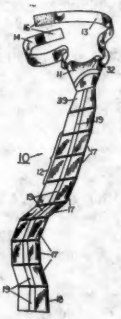
4,627,112
FIREFIGHTER'S COAT
William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417
Filed May 13, 1985, Ser. No. 733,195
Int. Cl.[4] A41D *1/02, 13/00*
U.S. Cl. 2—81 3 Claims

1. An improved firefighter's coat adapted for use with firefighter's pants extending downwardly from the waist of the firefighter to provide for full protection of the firefighter while also providing for less weight and improved freedom of movement and ventilation to reduce stress, comprising a jacket constructed of heat, flame and water resistant materials, the jacket including full length sleeve portions connected by a neck portion, a front portion and a rear portion, the front portion extending downwardly from the neck portion and having a lower edge disposed below the firefighter's waist and adjacent the upper part of the firefighter's legs, the rear portion extending downwardly from the neck portion and having a lower edge disposed significantly below the lower edge of the front portion and substantially above the knees of the firefighter to form a limited tail extension covering the lower rear



part of the torso of the firefighter, the front portion thus being significantly shorter than the rear portion to provide the firefighter's legs with freedom of movement while crawling and climbing, in addition to improved ventilation under the front portion, the limited tail extension of the rear portion of the jacket protecting the lower rear part of the torso of the firefighter especially during forward bending or crawling, and the combined portions of the jacket also providing for reducing the total weight of the firefighter's coat.

4,627,113
DECORATIVE NECKWEAR
Allen Lord, Frenchman's Rd., New Milford, Conn. 06776
Filed Jan. 10, 1986, Ser. No. 817,606
Int. Cl.[4] A41D *25/00, 25/02*
U.S. Cl. 2—144 26 Claims



1. A decorative neckwear device incorporating
A. a pillow-shaped simulated knot having a generally trapezoidal edge outline shape with a convex front face and a rear face converging downwardly toward each other from an upper central region of substantial thickness, with both faces terminating in a thin lower edge,
B. a vertically elongated fabric strip having an upper end secured to the lower edge of the simulated knot, a front face, a rear face, and a depending lower end,
C. a first plurality of substantially rigid thin flat panels of sheet material, each being less than one-tenth the thickness of the central region of the simulated knot and having upper and lower parallel edges, all said thin flat panels being successively adhesively bonded to the front face of the fabric strip , with the lower edge of each panel positioned parallel to and closely adjacent to the upper edge of the next lower panel,

D. a corresponding second plurality of substantially rigid thin flat panels of sheet material, each substantially corresponding in shape and thickness to a juxtaposed one of said first plurality of panels, and each successively adhesively bonded to the rear face of the fabric strip with its upper and lower edges substantially juxtaposed to corresponding respective upper and lower edges of said juxtaposed one of said first plurality of panels, forming a suple and resiliently flexibly hinged panel array of successive thin, flat sandwich panels connected for free undulatory flexing movement with both positive and negative curvature in adjacent regions of the array, and

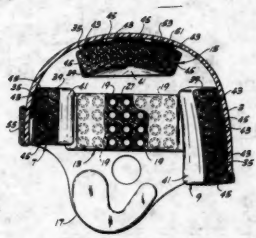
E. non-elastic neckband means connected to the simulated knot and protruding laterally therefrom to encircle the wearer's neck, having a first end and a second end adjustably and releasably securable to the first end, whereby the simulated knot is positioned in front of the wearer's neck, displaying the flexibly arrayed plurality of flat panels vertically depending therefrom.

4,627,114

SHOCK ATTENUATION STRUCTURE

Hal D. Mitchell, Rolla, Mo., assignor to Figgie International, Inc., Willoughby, Ohio

Filed Aug. 23, 1984, Ser. No. 643,429
Int. Cl.[4] A42B *3/02*; F16F *1/00*
U.S. Cl. 2—414 **23 Claims**



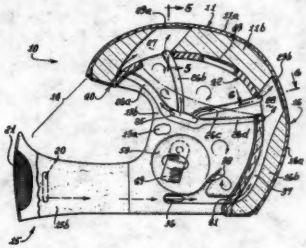
12. Protective apparatus for the head comprising a shell of substantially rigid material adapted to fit on the head and a plurality of separate shock attenuating modules disposed around the inside of the shell for protecting the head, at least one of said modules comprising a shock attenuating structure having a breadth greater than its thickness and a breadthwise cross section comprising a series of layers arranged side-by-side, said series comprising a first plurality of layers of shock-absorbing material having a relatively high resistance to compression and a second plurality of layers of shock-absorbing material having a lower resistance to compression, the layers of said first and second pluralities being disposed in contiguous side-by-side relation across substantially the entire breadth of the structure to form a substantially unitary structure, the layers of said second plurality alternating with the layers of said first plurality across the breadth of the structure and providing lateral support to the layers of the first plurality, said structure being mounted on the inside of the shell with its breadth generally perpendicular to the direction of impact force for broadside loading of the structure during an impact, said layers in the area of impact being adapted resiliently to deform for attenuating the shock resulting from said impact, with said layers of said second plurality providing lateral support to the layers of said first plurality during said impact.

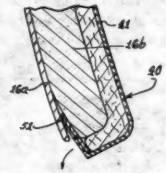
4,627,115

VENTILATED HELMET

Lester V. Broersma, Bellflower, Calif., assignor to Bell Helmets Inc., Norwalk, Calif.

Continuation of Ser. No. 572,893, Jan. 23, 1984, Pat. No. 4,555,816. This application Aug. 26, 1985, Ser. No. 769,386
Int. Cl.[4] A42B *3/02*
U.S. Cl. 2—425 **11 Claims**





1. In a motorcyclist or bicyclist helmet having dome shaped top wall structure, side wall structures, a front opening for forward viewing, a lower front wall structure which juts forwardly, and rear wall structure, the combination comprising:

(a) said wall structure defining passage means for circulating cooling air flow, and

(b) removable pad means carried by the helmet to extend across at least a portion of said passage means,

(c) and pad means retention structure comprising clip structure attached to the pad means and wedged upwardly between the shell and liner at a level or levels below major extent of said air flow passage means.

4,627,116

COMPOST TOILET APPARATUS

Hiroshi Shimizu, 24-19, Uedatsutsumi 1-chome, Morioka-shi, Iwate-ken, Japan

Filed Apr. 18, 1985, Ser. No. 724,853
Claims priority, application Japan, Apr. 18, 1984, 59-78920
Int. Cl.[4] A47K *11/02*
U.S. Cl. 4—111.6 **7 Claims**

1. A compost toilet apparatus, comprising:

a container having a longitudinal axis, upper and lower walls, longitudinal end walls and side walls;

a dividing wall, substantially perpendicular to said longitudinal axis, said wall extending from the bottom of said container to a position below the upper wall of said container, said dividing wall dividing said container into a fermentative chamber and a reservoir chamber, the space above said dividing wall comprising a connecting means for connecting said reservoir chamber to said fermentative chamber;

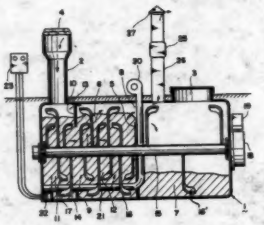
an input port connected to the upper wall of said fermentative chamber;

an output port connected to said reservoir chamber;

a stirring shaft mounted horizontally and extending through

said fermentative chamber in a longitudinal direction, said stirring shaft further extending through said dividing wall into said reservoir chamber;

stirring means, attached to that portion of said stirring shaft within said fermentative chamber, for causing sewage dumped into said fermentative chamber through said



input port to be directed toward said reservoir chamber through said connecting means while mixing the contents of said fermentative chamber; and

mixing means connected to that portion of said stirring shaft extending into said reservoir chamber for mixing the contents of said reservoir chamber.

4,627,117

PAPER COVER FOR LAVATORY SEAT

Kanji Morishita, 652, Higashihama Minamimachi, Fushimi-ku, Kyoto, Japan

Continuation of Ser. No. 571,532, Jan. 17, 1984, abandoned. This application Feb. 3, 1986, Ser. No. 825,769

Claims priority, application Japan, Jun. 13, 1983, 58-92276[U]

Int. Cl.[4] A47R *13/22*

U.S. Cl. 4—247 **2 Claims**

1. A roll of paper covers for a toilet bowl seat which seat has laterally spaced bowl-shaped side portions, said roll comprising a web of a plurality of lengths of paper at least as long as the front to back dimension of a bowl-shaped side portion and having a width greater than the width of the bowl-shaped side portion, said lengths of paper being defined by continuous transverse lines of perforations, each length of paper having at least one linear line of perforations extending inwardly from the opposite side edges substantially perpendicular thereto and at a position intermediate the ends of said lengths of paper, said line of perforations terminating short of the middle portion of each length of paper leaving the middle portion of each length of paper unperforated, the distance across said middle portion being sufficient to make the paper strong enough to remain untorn under a force substantially in the longitudinal direction of said web and which is sufficient to tear the paper along said continuous transverse lines of perforations.

4,627,118

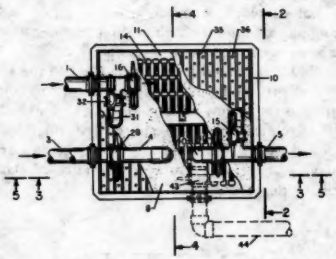
VACUUM FILTER FOR SWIMMING POOLS CONTROLLING WATER RECIRCULATION CAPACITY TO ACCOMMODATE VARYING GUTTER FLOW

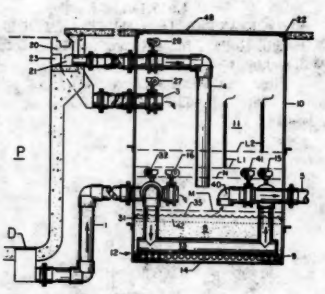
William H. Baker, 50 Fairway Ridge, Clover, S.C. 29710

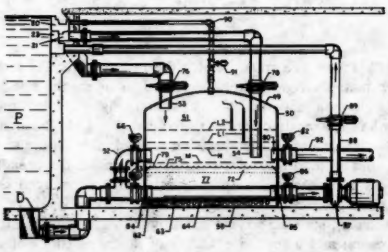
Filed May 4, 1984, Ser. No. 607,338

Int. Cl.[4] E04H *3/18, 7/00*

U.S. Cl. 4—510 **48 Claims**







1. A vacuum filter for vacuum flow filtration through a filter bed of water from a swimming pool including flow from the pool and from the gutter of the swimming pool, and controlling water recirculation capacity to accommodate varying gutter flow, comprising, in combination, a tank; a filter bed of particulate material in the tank; a first inlet line communicating the swimming pool with the tank for gravity flow into the tank and maintaining a predetermined level of water in the tank in relation to a level of water in the swimming pool, thereby providing a head of water for gravity backwash flow through the filter bed; a second inlet line communicating the tank with the perimeter gutter for the swimming pool for gravity flow into the tank; a third inlet line communicating the tank with the perimeter gutter for the swimming pool for suction flow into

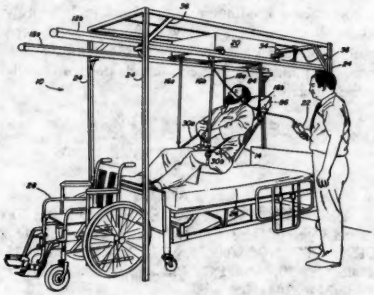
the tank; an outlet line communicating the tank with the water recirculation system; a pump drawing a vacuum downstream of the filter bed and recirculating filtered water to the swimming pool; and at least one water level-responsive sensor sensing and directly responding to the level of water in the tank and ajusting the valve controlling suction flow, to increase gutter drain flow to the tank sufficiently to prevent gutter water flooding back from the gutter to the pool.

4,627,119

APPARATUS TO ASSIST THE DISABLED

Francis J. Hachey, North Reading, and Henry J. Hachey, Fitchburg, both of Mass., assignors to ParaSystems, Inc., Waltham, Mass.

Filed Jan. 22, 1985, Ser. No. 693,294
Int. Cl.[4] A61G 7/10
U.S. Cl. 5—83 11 Claims



1. Apparatus for repositioning a disabled person, said apparatus comprising:

a pair of parallel support rails extending horizontally;

a cradle assembly for placement under the person disposed beneath said support rails, the cradle assembly comprising:

a flexible support material extending between a first pair of foot end lifting points connected to the material and a second pair of head end lifting points also connected to the material and longitudinally spaced apart from said first points; and

at least one stabilizing member connecting said first and second lifting points;

at least two first elongate support members attachable to said first pair of lifting points and at least two second elongated support members attachable to said second pair of lifting points on said cradle assembly, said support members being mounted for sliding horizontal movement along said rails;

first means for adjusting the length of both of said first support members between said cradle assembly and said rails to permit simultaneous raising and lowering of said first points on said cradle;

second means for adjusting the length of both of said second support members between said cradle assembly and said rails, independent of the length of said first support members, to permit simultaneous raising and lowering of said second lifting points on said cradle independent of said first lifting points and;

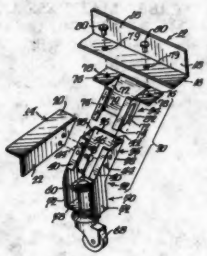
a control for actuating independently said first and second means for adjusting.

4,627,120

BED FRAME ASSEMBLY

George M. Harris, Homewood, Ill., assignor to Harris-Hub Company, Inc., Harvey, Ill.

Filed Jun. 4, 1984, Ser. No. 616,898
Int. Cl.[4] A47C 19/02
U.S. Cl. 5—201 8 Claims



1. A bed frame comprising a pair of spaced longitudinally extending parallel side-frame members, each said side-frame member having a horizontal leg portion,

a pair of spaced parallel cross-frame members extending between said side-frame members, each said cross-frame member having a vertical leg portion defining fastener receiving openings,

means for securing said side-frame members to the ends of said cross-frame members and for supporting said frame on a floor, said securing and supporing means comprising a plurality of first and second leg members, and floor engaging means,

a pair of said second leg members being mechanically secured to each of said side-frame members and tdlescopically disposed relative to said first leg members,

each said first leg member comprising an upper portion which is generally rectilinear in cross-section and which defines an upper end which is generally coplanar with the upper edge of said vertical leg portion of said cross-frame member, said upper portion comprising opposed spaced side walls, at least one of said side walls defining openings aligned with said openings in said cross-frame member vertical leg portion for receiving mechanical fasteners, said first leg member being positioned to confront and bear against said cross-frame member vertical leg portion, said upper portion being inclined inwardly and downwardly at an acute angle of at least 20 degrees relative to said cross-frame member,

said first leg member further defining a lower portion which is vertically disposed and which is integrally formed with said upper portion, said lower portion being disposed to mount said floor engaging means and to support said bed frame on a floor,

said second leg member being generally rectilinear in cross-section and defining side wall members parallel with the side walls of said first leg member, said second leg member being slidably and telescopically received entirely within the upper portion of an associated first leg member, said second leg member having ear means positioned to confront and engage said side-frame member horizontal leg portion, said horizontal leg portion and said ear means each defining aligned apertures for receiving mechanical fasteners, said second leg member defining recess means in said second leg side wall members for accommodating said mechanical fasteners in said cross frame members, said second leg member being inclined inwardly and downwardly at an acute angle substantially equal to the angle at which the associated first leg member upper portion is inclined,

and wherein, when said first leg members are telescopically

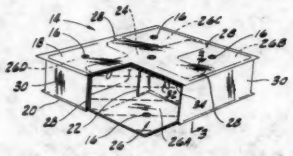
disposed relative to said associated second leg members, the side-frame and cross-frame members are secured to each other to form said bed frame and said leg member lower portions and associated floor engaging means are disposed inset of said side-frame members.

4,627,121

DAMPED WATERBED MATTRESS AND METHOD FOR MANUFACTURING SAME

Howard A. Winther, Union City, Calif., assignor to Royal Waterbeds, Inc., Ellisville, Mo.

Division of Ser. No. 567,466, Jan. 3, 1984, Pat. No. 4,574,026.
This application Aug. 19, 1985, Ser. No. 766,520
Int. Cl.[4] A47C 27/08
U.S. Cl. 5—451 **5 Claims**



1. A damped waterbed comprising:

a flexible, nonporous envelope having a top wall, a bottom wall and a side wall for enclosing a liquid;

a plurality of cells, each having a top cell wall, bottom cell well and side cell wall contained within said envelope, said cells having at least one cell aperture enabling fluid communication between the inside of said cells and the outside of said cells.

means for partitioning said cells into at least an inner chamber and an outer chamber, said partitioning means comprising a sole continuous loop of pliant material that connects said top cell wall and said bottom cell wall said partitioning means including at least one aperture enabling fluid communication between said inner chamber and said outer chamber;

means for supporting said top cell wall proximate said top wall of said envelope; and

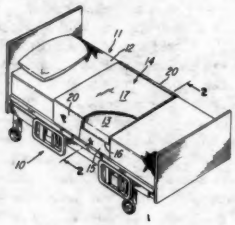
means for positioning said bottom cell wall proximate said bottom wall of said envelope.

4,627,122

HOSPITAL BED, METHOD OF MAKING SAME AND COMPONENTS THEREFOR

Marcel F. Hopp, Cincinnati, Ohio, assignor to Standard Textile Co. Inc., Cincinnati, Ohio

Filed Feb. 21, 1984, Ser. No. 581,576
Int. Cl.[4] A47G 9/00
U.S. Cl. 5—484 **20 Claims**



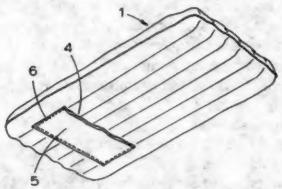
11. In a method of making a bed for a hospital or the like comprising the steps of, providing mattress means, disposing a bottom sheet means in covering relation on said mattress means, placing a waterproof layer over the central portion of said bottom sheet means, and placing a cover over said layer, the improvement in said method in which, said step of placing said layer comprises placing said layer comprised of a sheet of moisture impervious polymeric material having opposite ends of a particular width and having top and bottom moisture impervious surfaces in which at least one of said top and bottom surfaces of said sheet is completely exposed said sheet having a first pair of tails each made of a material which is different than said polymeric material and each having a width equal to said particular width, said first pair of tails extending from said opposite ends with each of said first pair of tails being attached along its full width, said step of placing said cover comprises placing said cover which is made only of three pieces consisting of a water-absorbent pad made of a particular material and having opposite end portions of a given width and having completely exposed top and bottom surfaces of said particular material between said end portions, said pad having a second pair of tails each made of a material which is different than said particular material of said pad and each having a width equal to said given width, said second pair of tails extending from and being attached in an exposed manner respectively against said opposite end portions, each of said second pair of tails being attached along its full width, and disposing said first and second pair of tails under said mattress means as the sole means holding said layer and pad securely on said bottom sheet means, said layer and pad being separate and readily individually removable from said bed for laundering thereof by pulling the respective tails thereof from under said mattress means.

4,627,123

BED TICK WITH POCKET FOR USER'S FEET

Kristian Uggerud, Peder Holters vei 1, 1168 Oslo 11, Norway

PCT No. PCT/NO84/00036, § 371 Date May 20, 1985, § 102(e) Date May 20, 1985, PCT Pub. No. WO85/01200, PCT Pub. Date Mar. 28, 1985
PCT Filed Sep. 19, 1984, Ser. No. 740,268
Claims priority, application Norway, Sep. 20, 1983, 833382
Int. Cl.[4] A47G 9/02
U.S. Cl. 5—485 **4 Claims**



1. A bed tick for a quilt having an external pocket near an end thereof dimensioned to receive solely the feet of an adult user, comprising:

a bed tick extending in a longitudinal direction from one end to another end thereof, said bed tick having a predetermined width; and

at least one pocket comprising a piece of fabric having a marginal edge along the periphery thereof extending transversely to said longitudinal direction and facing away from said one end of said bed tick, said marginal edge defining an opening into said pocket, said piece of fabric having the remaining portion of the periphery thereof fixedly secured by a seam to said bed tick, said pocket extending in said longitudinal direction for a distance less than said predetermined width of said bed tick.

4,627,124
DEVICE FOR SUPPORTING THE LAST ON A TOE LASTING MACHINE

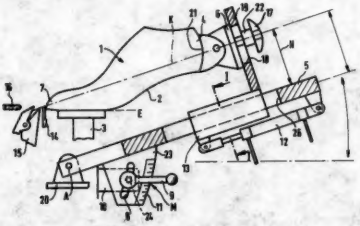
Gerhard Winter, Hauenstein, Fed. Rep. of Germany, assignor to Schon & Cie. Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,679

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1983, 3331020

Int. Cl.[4] A43D *21/08*

U.S. Cl. 12—12.4 **11 Claims**



1. A device for supporting a last on a toe lasting machine comprising:

last support means, adapted to be supported on a lasting machine frame, said last support means for supporting a last near the tip end thereof with a sole portion of the last facing in a downward direction, said last support means having a support surface extending in a plane; and

heel support means adapted to be supported on the lasting machine frame, said heel support means including a heel support carrier which extends in a longitudinal direction, said heel support means further including a heel support, said heel support having an abutment face which is shaped to substantially the shape of a heel portion of the last, said heel support being mounted for movement along said heel support carrier towards and away from said last support means for adjustment of the distance between said last support means and said heel support, said heel support carrier being pivotable about an axis, said axis being vertically below said last support means, said axis being parallel to said plane and said axis being perpendicular to said longitudinal direction of said heel support carrier, whereby said heel support carrier may be pivoted to an angular position such that said heel support is substantially parallel to a force acting in a longitudinal directon of the last during a lasting operation.

4,627,125
PAINT BRUSH

James H. Gruns, 5080 Woodson Dr., Mission, Kans. 66202

Continuation-in-part of Ser. No. 431,788, Sep. 30, 1982, Pat. No. 4,490,875. This application Oct. 22, 1984, Ser. No. 663,953

Int. Cl.[4] A46B *3/02, 17/06*

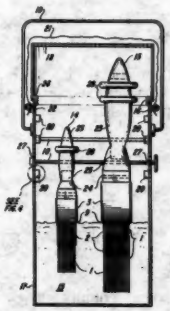
U.S. Cl. 15—105 **3 Claims**

1. A surface coatings applicator and applicator cleaning container assembly, wherein the applicator is comprised of a tubular ferrule having a cluster of bristles inserted part way into one end substantially to seal one end or said ferrule; a hardened mass of cured, resinous cement disposed atop said cluster of bristles in firm adhesive connection with portions of said cluster of bristles in said ferrule; and an integral handle including a contoured gripping portion extending outwardly from the other end of said tubular ferrule;

said handle being of rigid material and having a series of vertically aligned openings that extend through said handle such that a rod may inserted completely through a selected opening;

said openings having a round, triangular, polygon, or oval cross-section, and are located at specific distances from the lower edge of the ferrule, into which the bristle cluster is inserted, such that said rod, can be used to support one or more applicators of the same or differing length and/or size in a container of solvent, such that the level of solvent only covers the bristles of each applicator up to the lower edge of each ferrule for proper soaking and cleaning of all clusters of bristles;

said openings having a cross-section, such that said rod being provided with a similar cross section as said openings, will prevent rotation of the brush around said rod when the brush centroid of mass of the brush is above said rod;



said cluster of bristles being made of two bristle sub-groups and being distinctly different in bristle length and/or bristle color and/or shade;

said first bristle sub-group being longer and used for applying the surface coatings;

said second bristle sub-group being significantly shorter and/or of a contrasting color and/or shade to the first bristle sub-group, so as the reduce the possibility of a painter dipping the applicator too deeply into the coatings supply container.

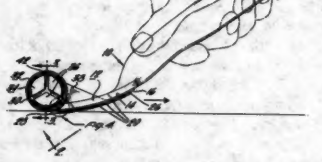
4,627,126
CLEANING DEVICE FOR HOOK AND LOOP FASTENERS

Thomas K. Nichols, 365 Amity Rd., Andover, N.J. 07821

Filed Sep. 5, 1985, Ser. No. 772,683

Int. Cl.[4] A47L *25/00*

U.S. Cl. 15—105 **17 Claims**



1. A device for cleaning the hooked portion of hook and loop fasteners comprising a body member, means on said body member defining a convexly curved surface, an array of hooked fastener elements secured to said curved surface, and means providing a sticky, debris attracting surface closely adjacent one edge of said array of hook fastener elements on said curved surface in substantially tangential alignment therewith, the relative movement of said device across a debris laden hooked fastener material engaging the array of hooked

fastener elements with the debris to lift the debris therefrom for collection on said sticky surface.

4,627,127

CYLINDRICAL BRUSH

Eugene J. Dupre, Somerset, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 13, 1985, Ser. No. 701,103
Int. Cl.[4] A46B 3/02, 7/10; A46D 3/00
U.S. Cl. 15—179 12 Claims

1. A cylindrical brush comprising

(a) an inner layer comprising a first elongate fabric strip formed of low-stretch cloth having a tensile strength greater than 200 psi and less than 8% stretch at 100 lbs. load and having parallel sides wound into a first helix with adjacent coils in said first helix abutting to provide a cylindrical shell having a hollow core,

(b) an outer layer comprising a second elongate fabric strip having parallel sides wound into a second helix with adjacent coils in said second helix abutting to provide a substantially continuous outer surface, said outer layer contacting and overlapping said inner layer, the curve formed by said second helix intersecting the curve formed by said first helix,

(c) adhesive material interposed between said layers to adherently bond together said inner layer and said outer layer; and

(d) bristles fastened to and covering at least a portion of the outer surface of said outer layer.

7. Method of preparing a cylindrical brush comprising the steps of:

(a) providing a cylindrical mandrel having two ends and comprising a plurality of separable elongated elements, which elements, when separated, form a circumferential plane having greater circumference than when unseparated,

(b) inserting at each end of said mandrel a means for separating said elongated elements,

(c) winding a first elongate fabric strip formed of low-stretch cloth having a tensile strength greater than 200 psi and less than 8% stretch at 100 lbs. load helically around said mandrel and in contact therewith,

(d) applying to at least one of said first fabric strip or to a second elongate fabric strip a curable adhesive material,

(e) while said adhesive material is still uncured, winding said second elongate fabric strip helically over said first strip and in contact therewith, the curve of said first helix intersecting the curve of said second helix, said first strip and said second strip forming a hollow cylinder,

(f) curing said adhesive material to form an adherent bond between said first fabric strip and said second fabric strip,

(g) removing said separating means to allow said elongated elements to become unseparated,

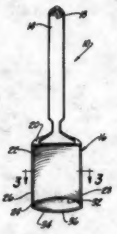
(h) removing said mandrel from said hollow cylinder.

4,627,128

TOOL FOR CLEANING THE INTERIOR SURFACES OF A CONTAINER

Thomas M. Shea, 1865 Harvest La., Bloomfield Hills, Mich. 48013

Filed May 6, 1985, Ser. No. 730,846
Int. Cl.[4] A47L 17/06
U.S. Cl. 15—236 R 8 Claims



1. A tool for scraping and cleaning an interior surface of a cylindrical container, said tool comprising:

an elongated handle having a longitudinal axis; and a blade member integrally secured to one end of said handle wherein said blade member comprises:

a substantially semicircular first end wall, said first end wall disposed perpendicular to said longitudinal axis of said handle, said first end wall having a semicircular edge;

an intermediate main portion having a substantially semicylindrical concave curvature formed about said axis of said handle wherein said main portion extends from and has a curvature coinciding with the semicircular edge of said first end member; and

a substantially elliptical second end wall secured to the opposite end of said main portion from said first end wall wherein said second end wall forms an obtuse angle with respect to said axis of said handle, said second end wall being flexible whereby said second end wall yields as second second end wall engages a bottom surface of said cylindircal container.

4,627,129

SPONGE AND FABRICATION METHOD

James M. Wittes, Linden, N.J., assignor to Stiefel Laboratories, Inc., Coral Gables, Fla.

Filed Jul. 19, 1984, Ser. No. 632,411
Int. Cl.[4] A47L 13/16
U.S. Cl. 15—244 C 7 Claims

1. A sponge, said sponge having a washing surface and a rounded back surface shaped to fit into a slightly cupped hand and to be held in said hand with a minimal bending of the

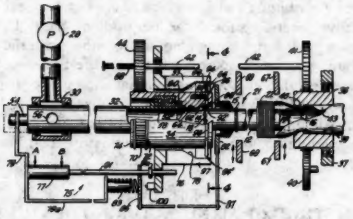
fingers of said hand, said sponge having a finger-receiving notch in one edge, which sponge has a flap of sponge material which is positioned adjacent said finger notch so that a finger in said notch can be used to press on the flap.

4,627,130

ROTATABLY DRIVEN CORED CASING ARTICLE

Joseph A. Nausedas, Oak Forest, and Michael P. Kazaitis, Chicago, both of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 29, 1983, Ser. No. 566,828
Int. Cl.[4] A22C *13/00*
U.S. Cl. 17—1 R 29 Claims



1. An elongated substantially rigid tubular core for supporting a shirred casing on a stuffing machine of the type having a rotary drive operable during stuffing of the casing, said tubular core comprising:

(a) fore and aft ends with said aft end being releasably connectable to a foodstuff discharge outlet of the stuffing machine to receive foodstuff pressed through the outlet for passage through said tubular core;

(b) a flange on said tubular core adjacent said aft end, said flange having a side surface extending generally upright to the longitudinal axis of said tubular core; and

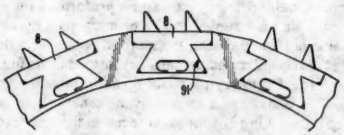
(c) drivable means on said side surface engagable by the rotary drive of the stuffing machine for rotatably driving said tubular core about its longitudinal axis.

4,627,131

COMBING ROLLER FOR AN OPEN-END SPINNING MACHINE

Kunio Iwata, Itami, Japan, assignor to Kanai Juyo Kogyo Co., Ltd., Hyogo, Japan

Filed Jul. 11, 1985, Ser. No. 753,877
Int. Cl.[4] D01G *15/84*
U.S. Cl. 19—97 6 Claims



1. A combing roller comprising:

a roller body having in the circumferential surface thereof a plurality of dovetail-shaped grooves extending substantially parallel to the axis of said roller body and spaced at regular intervals around said roller body; and

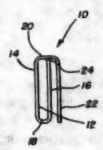
a plurality of needle plate laminated members removably fixed in said grooves; each needle plate laminated member having a plurality of needle plates each having a needle base portion with at least one needle head on the radially outer side thereof and a dovetail-shaped needle insertion portion on the radially inner side thereof with a receiving opening at the radially inner side of said needle insertion portion, said plates being in side by side relationship with said receiving openings aligned, and a connecting means extending through said receiving openings and holding said plates in side by side relation in said needle plate laminated member, said laminated needle plate members being held in said grooves against radial forces by the engagement of said needle insertion portions in said grooves.

4,627,132

BELT CLASP

Vivian C. Markham, 1490 Lowell Ct., Crofton, Md. 21114

Filed Nov. 6, 1984, Ser. No. 668,797
Int. Cl.[4] A44B *13/00*
U.S. Cl. 24—169 1 Claim



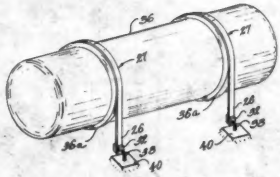
1. A belt clamp for clamping the loose end of a belt against the body encircling portion of the belt to prevent the loose end from hanging, comprising a substantially U-shaped clasp having two legs and a connecting member, one of said legs being longer than the other and turned upon itself to form a third leg inside the U-shaped clasp and being parallel to the other two legs, the end of said longer turned in leg contacting the inner portion of the connecting member of the U and attached thereto to form a closed loop.

4,627,133

PULTRUDED UNDERGROUND TANK HOLD-DOWN STRAP ASSEMBLY

David H. Bartlow, Conroe, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 8, 1985, Ser. No. 763,723
Int. Cl.[4] B65D *63/02;* A44B *21/00*
U.S. Cl. 24—298 4 Claims



1. A pultruded strap assembly for holding down underground tanks, said assembly comprising a flat glass fiber reinforced resin strap particularly characterized in that it is formed by the pulling of glass fiber reinforcing material through hardenable liquid resin and thereafter through a heated curing and shaping die, each of a pair of opposite end portions of the strap being secured flatwise between a pair of flat plates disposed respectively on opposite sides thereof and connected to each other solely by fasteners extending through the strap, each plate having an aperture extending therethrough, and each end portion of the strap having an aperture extending therethrough and aligned with the apertures of the respective pair of plates, whereby each pair of plates and the respective end portion of the strap are adapted to receive a portion of a retaining rod extending perpendicularly thereto through said apertures.

4,627,134

BALL-SIDE PIECE OF SNAP FASTENER

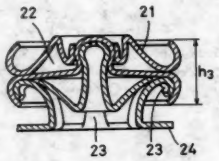
Akihiko Takata, Fujisawa, Japan, assignor to Scovill Japan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1986, Ser. No. 821,175

Claims priority, application Japan, Jan. 24, 1985, 60-7323[U]

Int. Cl.[4] A44B *1/38*

U.S. Cl. 24—687 4 Claims



1. A ball-side piece of a snap fastener comprising an inside member having a portion adapted to be in contact with one side of a fabric or the like and a guide face portion provided therearound to receive and guide curved tips, or claws, of a backing member, and an outside member extended over and secured to the periphery of the inside member, said outside member having a round head adapted to engage a socket-side piece of the snap fastener, a flat flange portion adapted to contact the one side of the fabric or the like and hold the deformed claws of the backing member as attached to the fabric or the like, and a curved guide face portion extending over the guide face portion of the inside member toward the periphery of the flat flange portion so as to receive and guide the claws of the backing member.

4,627,135

BURNER UNIT FOR THE FLAME TREATMENT OF FLAT TEXTILE MATERIALS

Walter Osthoff, Wuppertal, Fed. Rep. of Germany, assignor to Osthoff Senge GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

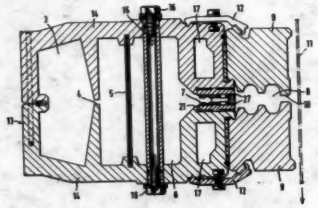
PCT No. PCT/DE84/00200, § 371 Date May 29, 1985, § 102(e) Date May 29, 1985, PCT Pub. No. WO85/01529, PCT Pub. Date Apr. 11, 1985

PCT Filed Sep. 29, 1984, Ser. No. 740,045

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335302

Int. Cl.[4] D06C *9/02*

U.S. Cl. 26—3 13 Claims



1. Burner unit for the flame treatment of flat textile materials, especially a burner unit for singeing machines, with a combustion chamber terminating in a singeing slot supplied from a gas mixture chamber by way of two parallel burner slots, the gas mixture chamber being encased by a burner element including two substantially U-shaped profile members clamped together along their longitudinal edges with the interposition of a mixture distributing rail delimiting the burner slots respectively along an inner longitudinal side, characterized in that the mixture distributing rail is enclosed between two guide strips respectively defining the outer longitudinal side of the burner slots, the guide strips are clamped together with the mixture distributing rail as a package between the two substantially U-shaped profile members, and in that the guide strips include a narrow bulge upstream of the burner slots along their outer side, these strips being clamped in place between the two substantially U-shaped profile members at this bulge.

8. Burner unit for the flame treatment of flat textile materials, especially a burner unit for singeing machines, with a combustion chamber terminating in a singeing slot supplied from a gas mixture chamber by two parallel burner slots, the gas mixture chamber being encased by a burner element including two substantially U-shaped profile members clamped together along their longitudinal edges with the interposition of a mixture distributing rail delimiting the burner slots respectively along an inner longitudinal side, characterized in that the mixture distributing rail is enclosed between two guide strips respectively defining the outer longitudinal side of the burner slots, the guide strips being clamped together with the mixture distributing rail as a package between the two substantially U-shaped profile members, and in that each guide strip is provided with a fitting lug on its contact surface facing the mixture distributing rail, and that this fitting lug engages in a corresponding counter groove of the mixture distributing rail.

4,627,136

METHOD OF MANUFACTURING DENTURES

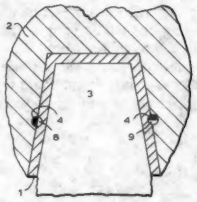
Hans-Albert Kreylos, Langen, and Manfred P. Zeiser, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Guenter Ruebeling, Bremerhaven, Fed. Rep. of Germany

Filed Apr. 30, 1982, Ser. No. 374,604

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118890; European Pat. Off., Apr. 5, 1982, 82102899.0

Int. Cl.[4] B23P *13/02*

U.S. Cl. 29—160.6 14 Claims



1. A method of manufacuting dentures, such as crown bridges, partial or complete dentures and the like, including a preformed metal primary part and a preformed metal secondary part which is coupled to the primary part by at least one releasable holding element, the method comprising the steps of setting the secondary part totally preformed to its final form on the preformed primary part and forming in said primary part and said secondary part recesses simultaneously in one working step by sparking erosion, said recesses together constituting an opening for receiving said holding element, said holding element being soldered within one of said recesses to connect the primary part to the secondary part.

4,627,137

DEVICE FOR TREATING NONWOVENS

Eberhard Wildt, Grenzach-Wyhlen, Fed. Rep. of Germany, assignor to Robert Casaretto KG, Grenzach-Wyhlen, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,443

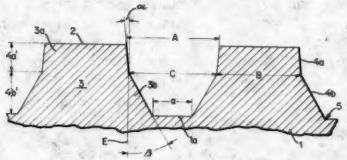
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326281

Int. Cl.[4] B32B *31/20*

U.S. Cl. 29—121.2 16 Claims

1. a device for heat- and/or solvent-treatment of fibers in

nonwovens or the like, comprising a rotary body having a substantially cylindrical peripheral surface, and a plurality of neighboring protrusions extending outwardly beyond said peripheral surface, each of said protrusions including a first section having a top land, and a second section between said



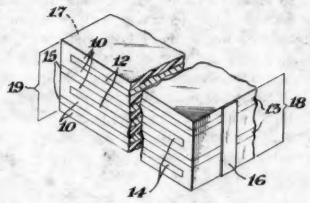
surface and said first section, said first sections having first facets each making with the respective top land a first acute angle, and said second sections having second facets each making with the respective top land a second acute angle which is smaller than the first acute angle, each of said first angles being greater than about 20°.

4,627,138

METHOD OF MAKING PIEZOELECTRIC/PYROELECTRIC ELEMENTS

Jang-hi Im, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 6, 1985, Ser. No. 762,884
Int. Cl.⁴ H01L *41/00*
U.S. Cl. 29—25.35 **7 Claims**



1. A method for manufacturing a piezoelectric element comprising the steps of:
(a) coextruding alternating layers of
(1) polymeric piezoelectric meterial; and
(2) polymeric electrode material arranged
so that a single edge of each successive layer of polymeric electrode material is alternatingly exposed to one of two separate faces of the piezoelectric element;
(b) electrically interconnecting on each of the two separate faces the exposed single edges of polymeric electrode material layers with conductive material; and
(c) polarizing the polymeric piezoelectric material.

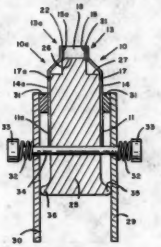
4,627,139

METHOD FOR MANUFACTURING CERAMIC CAPACITORS

Rolf Müller, Auenwald-Unterbüden, Fed. Rep. of Germany, assignor to Vitramon, Incorporated, Monroe, Conn.

Filed Jun. 21, 1983, Ser. No. 506,295
Int. Cl.⁴ H01G *4/06, 1/14*
U.S. Cl. 29—25.42 **8 Claims**

1. Method for manufacturing a plurality of monolithic ceramic capacitors comprising the steps of providing a pair of parallel lead carriers formed from thin flat conductive metal, each of said carriers comprising an elongate base strip and a plurality of uniformly-spaced, parallel lead elements extending upwardly therefrom, each said lead element having a leg portion removably-connected to said base strip and an upper contact face portion and having a width greater than its thickness, aligning and spacing said parallel lead carriers so that the contact faces of lead elements on each of said lead carriers face each other and are spaced by a distance similar to the length of an elongate capacitor body to form opposed lead pairs, supporting an elongate capacitor body with its end terminals in predetermined fixed position against the contact faces of the lead elements of each said lead pair, pressing the lead elements of each said lead pair against the end terminals of each said capacitor body with sufficient force to form an assembly in



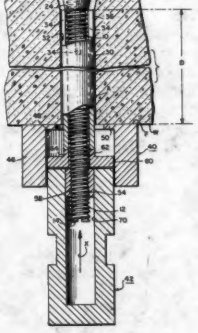
which each said capacitor body is held in place against the effects of gravity, inverting said assembly and immersing said capacitor bodies in a bath of liquid solder to form conductive solder connections in predetermined fixed positions between the contact face portions of each of said lead elements and an end terminal of a capacitor body whereby each said opposed lead pair is soldered to a capacitor body and the width of the leg portions of said lead elements extends in a direction perpendicular to the axis of the elongate capacitor bodies, and disconnecting the leg portions of said lead elements from said lead carriers at a location adjacent the base strips thereof.

4,627,140

ANCHOR BOLT SETTING IMPACT TOOL

Maurice J. Davis, Hicksville, N.Y., assignor to Drilco Devices Limited, Long Island City, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,418
Int. Cl.⁴ B23P *19/04;* B25B *27/14*
U.S. Cl. 29—264 **11 Claims**



1. An impact tool for positioning and setting an anchor bolt assembly in a hole extending inwardly through the wall surface

of a structure, the anchor asssembly being of the type including a stud bolt having a threaded outer end extending from the wall and an inner end carrying the smaller end of a cone which enlarges away from said surface and the assembly further including a sleeve surrounding the bolt and operative to have its inner end expanded by the cone when the sleeve is axially moved over it, the tool comprising:

(a) a holder member having a bore therethrough to receive the outer end of the bolt and the sleeve and having means to rigidly support the threaded outer end of the bolt, and having at one end of said bore a transverse face oriented normal to the axis of the bolt to abut the surface of the wall and position the cone a fixed distance inside the hole;

(b) a driver member which is an element separate from said holder member and which is insertable into the bore of the holder member in axial alignment with the outer end of the sleeve and operative to be impact-driven in the direction of said cone to drive the sleeve further into the wall so that its inner end is expanded over the rigidly positioned cone; and

(c) said means to rigidly support the outer end of the bolt to position the cone at a fixed distance inside the hole comprising complementarily threaded means in said holder member to receive and engage the threaded end of the stud bolt.

4,627,141

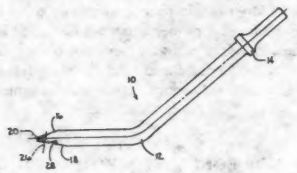
AUTOMOBILE HINGE PIN REMOVER

Eldor M. Teske, P.O. Box 107, North Prairie, Wis. 53153

Filed Mar. 12, 1985, Ser. No. 711,059

Int. Cl.⁴ B25B *27/02*

U.S. Cl. 29—275 **9 Claims**



1. A hinge pin remover for use on a hinge pin having a pointed end, a shaft portion and a head with an underside, said remover comprising a member which is a shaft having opposite first and second ends and a diameter, said first end being adapted to be driven by hammer means, and second end being tapered and including opposite, converging, generally flat first and second surfaces, said first and second surfaces converging to form a flat end having a thickness substantially less than the diameter of said shaft, said flat end being adapted to engage the underside of the head of the hinge pin for driving the hinge pin out of a hinge, and said flat end including a first depression adapted to engage the shaft portion of the hinge pin and to locate said flat end relative to the hinge pin, and one of said surfaces including a second, elongated depression extending longitudinally of said shaft from said first depression, said member including means adjacent said second end for engaging the pointed end of the hinge pin for driving the hinge pin out of the hinge.

4,627,142

CRIMPING

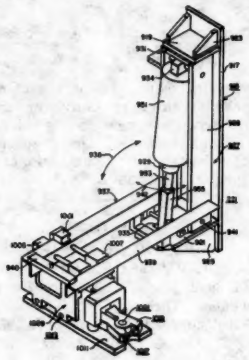
Leonard P. Hornak, North Huntingdon Township, Irwin County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 6, 1984, Ser. No. 617,855

Int. Cl.⁴ B25B *25/00*

U.S. Cl. 29—283.5 **8 Claims**

1. A crimping tool for use in replacing the old split-pin assemblies of a guide tube of a nuclear reactor by new split-pin assemblies, each of said new split-pin assemblies including a new split-pin secured to said guide tube by a new nut, said new nut having a locking cap secured thereto, said locking cap to be crimped onto said new split pin, the said new split-pin assembly being in position to be processed, said crimping tool having a crimping mechanism, a support for said crimping mechanism, said support being in the standby state of said tool, in generally vertical position, a drive, a driven member, connected to said drive, movable by said drive over a predetermined path, means, connecting said driven member to said



support, to move said support vertically from said generally vertical position to a generally horizontal position, as said driven member is driven by said drive along a first part of said path, and cam means, cooperative with said driven member, as said driven member is driven over a succeeding second part of said path, actuable, when said support is in generally horizontal position, for moving said support generally horizontally to set said crimping mechanism in position, relative to said split-pin assembly positioned to be processed, to crimp said locking cap onto said split pin.

4,627,143

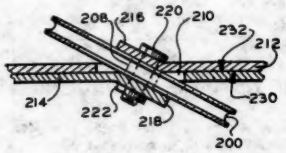
METHOD OF FORMING TELESCOPING SHUTTLE TABLE FOR MOUNTING AT LEAST ONE SHEAVE THERETO

Weston R. Loomer, Florence, Ky., assignor to Litton Systems Inc.

Division of Ser. No. 504,416, Jun. 15, 1983. This application Oct. 16, 1985, Ser. No. 787,917

Int. Cl.⁴ B23P *11/00*

U.S. Cl. 29—434 **3 Claims**



1. The method of forming a telescoping shuttle table for mounting at least one sheave thereto; comprising:

(a) forming a first table plate with first and second surfaces;

(b) forming a flap of material from the material of said first table plate at a predetermined location thereon and so as to extend outwardly at an acute angle from said surface of said first surface;

(c) forming a second table plate of substantially the same size

and configuration as said first table plate and with first and second surfaces;

(d) forming a flap of material from the material of said second table plate at a predetermined location thereon and so as to extend outwardly from said first surface of said second table plate at an acute angle with respect to said first surface of said second table plate;

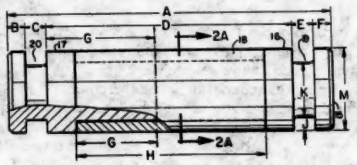
(e) affixing said first table plate to said second table plate so that said second surface of said first table plate contacts said second surface of said second table plate and so that said flaps of said first and said second table plates are aligned with parallel to and overlapped but spaced from each other and rotatably mounting a sheave between said spaced flaps.

4,627,144

METHOD OF MAKING PIN WITH MANGANESE STEEL SHROUD

James E. Burke, Philadelphia, Pa., assignor to Wescott Steel, Inc., Trevose, Pa.

Filed Mar. 8, 1985, Ser. No. 709,503
Int. Cl.[4] B23P *11/02*; F16C *11/06*
U.S. Cl. 29—447 **14 Claims**



1. A method of making a pin for a bushing for a high wear, high abrasion, heavy loading joint comprising:

heat forming a plate of austenitic manganese steel into a U form having a radiused section which matches the radius of a reduced diameter groove in a core of high strength, hardened alloy steel;

assembling said U-form with its radiused section in the groove in said core;

forging the legs of said U-form into the groove in said core to produce a shroud of austenitic manganese steel in said groove.

4,627,145

WINDOW GLASS MOUNTING ARRANGEMENTS

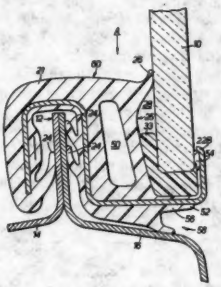
Gerd Niemanns, Grefrath, Fed. Rep. of Germany, assignor to Draftex Industries Limited, Edinburgh, Scotland

Filed May 15, 1984, Ser. No. 610,597
Claims priority, application United Kingdom, May 20, 1983, 8314079
Int. Cl.[4] B23P *11/02*; E04B *1/62*
U.S. Cl. 29—450 **11 Claims**

1. A window glass mounting arrangement, comprising

first and second parts for mounting in respectively different positions on a mounting flange extending around a window opening and respectively defining channel means for receiving the window glass,

the first part being mounted along at least one side of the window opening and the channel means in the said first part comprising flexible material having a rigid metal insert extending along the full length of the said at least one side and defining a first portion which embraces the said flange and a second portion which emerges from the flexible material to provide a rigid outside wall means of



the channel means for requiring the window glass to be slid in position through the open mouth of the channel means of this part, and

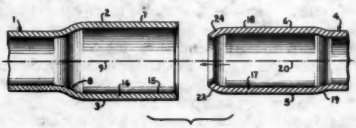
the second part being mounted along at least the opposite side of the window opening and the channel means of the second part having a flexible outside wall means for flexing outwardly to enable the window glass to be moved bodily sideways into the channel means in the said second part, the outside wall means of the second part thereafter resiling.

4,627,146

METHOD OF PRODUCING PIPE JOINTS

Gregg D. Ward, Olathe, Kans., assignor to Energy Pipelines International Company, Kansas City, Mo.

Filed May 25, 1984, Ser. No. 613,973
Int. Cl.[4] B23P *25/00*
U.S. Cl. 29—458 **6 Claims**



1. A method of forming pin and bell joints between the ends of tubular elements mode of metallic material subject to strain hardening, the method including the steps of:

(a) expanding the end of one element to form a substantially cylindrical pin;

(b) expanding the end of the other element a greater amount to form a substantially cylindrical bell with an inside diameter less than the outside diameter of said pin;

(c) the respective expansions being sufficient to strain the material of said tubular elements beyond the elastic limit thereof so as to induce strain hardening therein;

(d) the strain hardening in said bell being below the ultimate strength of the bell material;

(e) said differences in diameter being such that upon press-fit insertion of said pin into said bell, said bell is further strained beyond the elastic limit thereof to a point where

the ultimate strength of the bell material is approached; and

(f) press-fit inserting said pin into said bell.

6. A method of forming pin and bell joints between ends of first and second tubular elements made of metallic material subject to strain hardening, said method including the steps of:

(a) expanding said ends beyond the elastic limit of said material to form an expanded pin on an end of said first tubular element and an expanded bell on an end of said second tubular element; said expanding forming an interfering pin and bell of such conditions as to permit further deformation of at least one of said pin and bell further beyond the elastic limit thereof when said pin is press-fit inserted into said bell;

(b) said expanding straining the material sufficiently to produce strain hardening of the resultant pin and bell; and,

(c) further straining beyond the elastic limit of said material at least one of said pin and bell;

(i) said further straining being produced by press-fit insertion of said pin into said bell thereby straining at least one of said pin and bell further beyond the elastic limit thereof to a point where the ultimate strength of the material of at least one of said pin and bell is approached.

4,627,147

METHOD OF CONSTRUCTING A REFRACTORY PLATE ASSEMBLY FOR USE IN A SLIDING CLOSURE UNIT

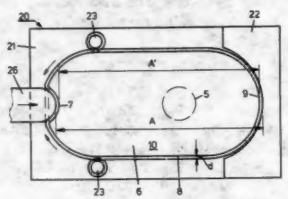
Otto Kägi, Cham, Switzerland, assignor to Stopinc Aktiengesellschaft, Baar, Switzerland

Filed Apr. 8, 1985, Ser. No. 721,068

Claims priority, application Switzerland, Apr. 24, 1984, 2002/84

Int. Cl.[4] B21D *39/00*; B23P *11/00*

U.S. Cl. 29—515 **14 Claims**



1. A method of manufacturing a prefabricated refractory closure plate assembly adapted to be readily inserted in a sliding closure unit, said assembly being of the type including a plate-shaped refractory member having therethrough at least one discharge opening and a metal jacket in tension surrounding and compressing the peripheral edge of said refractory member, said method comprising:

providing said refractory member with at least one indentation extending inwardly from said peripheral edge of said refractory member;

positioning a metal ring of a given width and thickness to surround said peripheral edge of said refractory member such that the entire width of a portion of said metal ring extends across said indentation;

pressing said portion of said metal ring across the entire width thereof into said indentation until an innermost external surface of said portion is spaced a predetermined distance from the external surface of said metal ring at a position at said peripheral edge of said refractory member opposite said indentation; and

said pressing comprising permanently increasing the length of said metal ring by stressing said metal ring beyond the elastic limit thereof and thereby permanently deforming and tensioning said metal ring into intimate compression contact with said peripheral edge of said refractory member, thereby forming a prefabricated assembly of said refractory member and said metal ring permanently connected thereto which may be assembled within a supporting frame of a sliding closure unit.

4,627,148

METHOD OF PRODUCING HIGH-PURITY METAL MEMBER

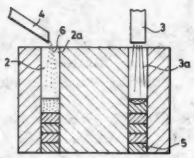
Hiromichi Imahashi; Masahisa Inagaki, both of Hitachi; Kimihiko Akahori, Katsuta, and Hajime Umehara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 679,075

Claims priority, application Japan, Dec. 7, 1983, 58-231036

Int. Cl.[4] B21D *39/00*; B23P *11/00*

U.S. Cl. 29—516 **10 Claims**



1. A method of producing a composite nuclear fuel cladding comprising an outer tube of zirconium alloy and a liner of pure zirconium, which comprises the steps of:

charging a raw material of sponge zirconium into a hearth disposed horizontally under a high vacuum atmosphere;

irradiating the raw material with an electron beam having a density of at least 50 W/mm^2 to melt the raw material in a limited area and to evaporate away impurities from the molten raw material;

shifting the hearth in its lengthwise direction to provide high purity ingots of zirconium;

forming a columnar ingot by remelting said ingots;

forging said columnar ingot;

perforating said columnar ingot to form a sleeve;

reducing the sectional area of said sleeve by rolling to form a liner, said liner being inserted into said outer tube; and

subjecting said liner inserted in said outer tube to hot extrusion, cold rolling and annealing.

4,627,149

METHOD OF MOUNTING AN ANNULAR ELEMENT ON A METAL TUBE OF ALUMINUM OR AN ALLOY THEREOF

Francois Colas, Bourg La Reine, France, assignor to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Filed Apr. 16, 1984, Ser. No. 600,831

Claims priority, application France, Apr. 20, 1983, 83 06874

Int. Cl.[4] B21D *39/00*; B23P *11/00*

U.S. Cl. 29—516 **8 Claims**

1. A method for mounting an element on a metal tube, which comprises:

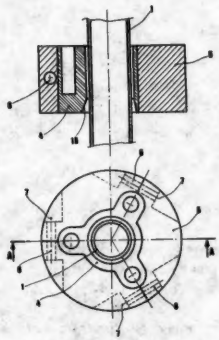
surrounding the said tube by a tubular sleeve of aluminum or an alloy thereof, which is sufficiently thin to be plastically deformable and have a similar cross-section, with suitable clearance, with one of the sleeve ends having an outside bevel;

surrounding said tube, on the side of the sleeve bevel, with an annular element to be fastened, wherein said annular element has an external shape and at least one opening whose crosswise dimensions are greater than those of said tube, and whose radial clearance with said tube is less than the thickness of said sleeve, and which has, on the sleeve side, an inside bevel whose maximum crosswise dimensions are greater than the crosswise dimensions of the end of the sleeve without the bevel;

temporarily surrounding and supporting said annular ele-

ment with a detachable hoop having an internal shape and size corresponding to said shape and size of said annular element;

moving the beveled end of said annular element and the beveled end of said sleeve toward one another by a suitable means, and introducing said sleeve by force between the annular element and said tube while radially inwardly



plastically deforming and interlocking said sleeve and said tube, said sleeve being radially inwardly plastically deformed over substantialy its whole length, thereby permanently mounting the said annular element on said tube without deforming said external shape of said annular element; and

removing said hoop.

4,627,150

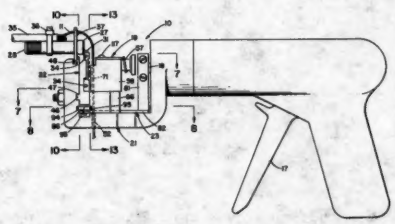
TOOL FOR INSERTING CABLE WIRES IN CONNECTOR CONTACTS

David W. Burnett, Arlington Heights, Ill., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Dec. 28, 1983, Ser. No. 566,257

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—566.4 **1 Claim**



1. A hand tool for inserting wires into contacts of an electrical device, which comprises:

a frame formed with a first and a second elongated open slot;

a holder slideably mounted in said frame for supporting the electrical device with a pair of its contacts positioned in an insertion site;

a block assembly mounted in said frame and including a first slot formed therein, a plate having a stepped surface, and a pair of holes extending from said stepped surface for receiving a pair of wires to be inserted in a pair of contacts of the device;

a pair of adjacent vertically displaced insertion blades slideably mounted in said first slot of the block assembly and adapted to ride on said stepped surface during their movement toward and away from the insertion site, each of said insertion blades having a first tip section for exerting a force against a wire and a second tip section for shearing a wire;

a trigger operated means for simultaneously moving the insertion blades into the insertion site to force the pair of wires interposed between the insertion blades and the pair of contacts into engagement with the contacts and to shear said wires in said holes at points adjacent to the contacts in which the wires are inserted upon depression of the trigger operated means;

means operated by the release of the trigger operated means for indexing the holder to move the next pair of contacts into the insertion site; and

a dressing plate detachably mounted on said holder and having one edge formed with a series of wire receiving slots and the other edge fittable within said first elongated open slot for guiding said holder to move transversely of said insertion blades, said holder being formed with a transversely extending flange slidably mounted in said second slot for guiding said holder during said transverse movements.

4,627,151

AUTOMATIC ASSEMBLY OF INTEGRATED CIRCUITS

Wayne A. Mulholland, Plano; Daniel J. Quinn; Robert H. Bond, both of Carrollton, and Michael A. Olla, Flower Mound, all of Tex., assignors to Thomson Components-Mostek Corporation, Carrollton, Tex.

Filed Mar. 22, 1984, Ser. No. 592,185

Int. Cl.[4] H01L *21/28*

U.S. Cl. 29—569 R **7 Claims**

1. A method of processing semiconductor integrated circuit devices comprising the steps of:

a. applying a dielectric top coating having a top surface over at least two integrated circuits on a wafer;

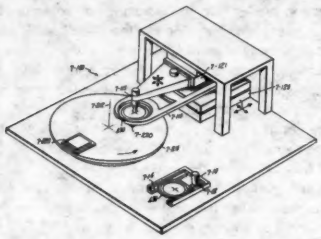
b. forming at least two arrays of conductive leads from predetermined nodes of said integrated circuits along said top surface of said dielectric top coating to at least two corresponding predetermined arrays of electrical contacts disposed on said top surface of said dielectric above each of said at least two circuits;

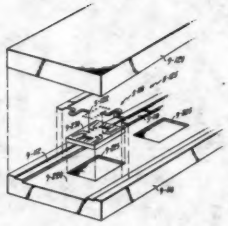
c. separating said at least two circuits to form at least two circuit chips by cutting entirely through said wafer while leaving a cover portion of said dielectric above each of said integrated circuits and below said standard arrays;

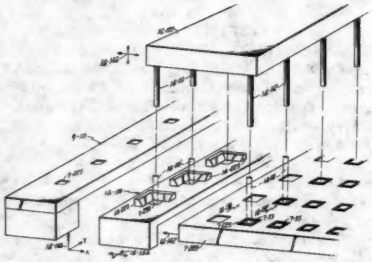
d. removing a selected chip from said at least two circuit chips by striking an adhesive support member having an adhesive side to which said selected chip is attached and an opposite side at a point on said opposite side opposite said selected chip, thereby releasing said chip from said adhesive;

e. positioning a leadframe, having an array of contact members disposed in a lead contact array positionally matching said predetermined array of electrical contacts, in alignment with said selected chip so that said lead contact array touches said array of electrical contacts, said at least two predetermined arrays of electrical contacts being sized to fit on at least two different integrated circuit chips so that

said leadframe may be used with more than one integrated circuit; and







f. conductively bonding at least two of said array of electrical contracts to said lead contact array simultaneously.

4,627,152

AUTOMATIC LAYOUT FOR CASCODE VOLTAGE SWITCH LOGIC

Mitchell R. DeHond, Essex Junction, and Paul J. Ledak, Colchester, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 24, 1985, Ser. No. 737,614

Int. Cl.[4] H01L *29/78, 21/78*

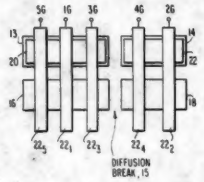
U.S. Cl. 29—571 **4 Claims**

1. A method of synthesizing a circuit comprising paired N-type and P-type field effect transistors from a logic gate representation, comprising the steps of:

dividing said logic gate representation into one or more functional blocks, each said block having no more than a first predetermined number of serially connected P-type transistors and no more than a second predetermined number of serially connected N-type transistors;

ordering the pairs of transistors for maximizing the number of pairs of contigously connected transistors, said P-type transistors being arranged in a first linear array and said N-type transistors being arranged in a second linear array;

then establishing the internal wiring connections exclusive of said contiguous connections between said transistors in said first array and between said transistors in said second array from the types of logic gates represented by said transistors; and



creating a circuit layout of said first linear array of said ordered P-type transistors parallel to said second linear array of said ordered N-type transistors including said contiguous connections; and

interconnecting said N-type transistors and interconnecting said P-type transistors according to said internal wiring connections.

4,627,153

METHOD OF PRODUCING A SEMICONDUCTOR MEMORY DEVICE

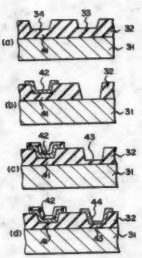
Fujio Masuoka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 344,047, Jan. 29, 1982, Pat. No. 4,525,811. This application Apr. 15, 1985, Ser. No. 723,294

Claims priority, application Japan, Feb. 6, 1981, 56-16651

Int. Cl.[4] H01L *29/78, 29/60*

U.S. Cl. 29—571 **1 Claim**



1. A method for manufacturing an MOS static RAM including enhancement type MOS transistors in a flip-flop circuit of a memory cell, enhancement type MOS transistors for selection of said memory cell, and enhancement type MOS transistors in a peripheral circuit, all said enhancement type transistors being formed in a common semiconductor substrate also containing a memory matrix, said method comprising the steps of:

(a) forming a thick oxide film on a surface of said substrate;

(b) removing portions of said thick oxide film from an area corresponding to an enhancement type MOS transistor formation region to expose a first area of said substrate surface;

(c) forming a first gate oxide film on said exposed first area of said substrate surface;

(d) forming a first polysilicon layer on said thick oxide film and on a portion of said first gate oxide film corresponding

to said enhancement type MOS transistors for memory cell selection;

(e) selectively removing said first polysilicon layer to form a gate electrode and a wiring layer for each enhancement type MOS transistor for memory cell selection;

(f) removing said first gate oxide film from an area corresponding to said enhancement type MOS transistors in said peripheral circuit and in said flip-flop circuit to expose a second area of said substrate surface;

(g) forming a second gate oxide film on said exposed second area of said substrate surface, said second gate oxide film being thinner than said first gate oxide film;

(h) forming a second polysilicon layer on said thick oxide film and an area of said second gate oxide film corresponding to said enhancement type MOS transistors in said flip-flop circuit and in said peripheral circuit;

(i) selectively removing said second polysilicon layer to provide a wiring layer and a gate electrode for each enhancement type MOS transistor in said flip-flop circuit and in said peripheral circuit; and

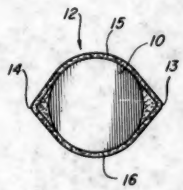
(j) diffusing an impurity into source and drain formation regions of each of said enhancement type MOS transistors to form source and drain regions for said transistors.

4,627,154

CELL JACKETING

Timothy A. Pattison, Lilburn, Ga., assignor to Duracell Inc., Bethel, Conn.

Filed Sep. 3, 1985, Ser. No. 771,914
Int. Cl.[4] H01M *2/02*
U.S. Cl. 29—623.1 **13 Claims**



1. A method for uniform heat shrink jacketing of an electrochemical cell container, with a heat shrink jacketing material, with reduced distortion of said jacketing material upon heat shrinking, characterized in that said method comprises the steps of heating said cell container to a temperature for a period of time sufficient to soften the heat shrink jacketing material when positioned thereon but below a temperature which will rapidly heat shrink the jacketing material, positioning said jacketing material on said cell container, permitting the jacketing material and the cell container to heat stabilize, and thereafter rapidly heat shrinking said jacketing material onto said cell container.

4,627,155

TUBE EXTRACTING APPARATUS

Robert C. Mancabelli, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 8, 1985, Ser. No. 752,770
Int. Cl.[4] B23P *15/26, 19/00*
U.S. Cl. 29—726 **20 Claims**

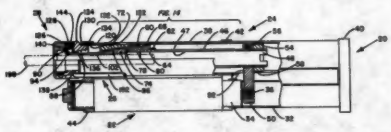
1. A tube extracting apparatus, comprising:

a pull shaft having opposite end portions and being reciprocative between an extended position and a retracted position,

a compression member being connected to one of said end portions of said pull shaft for reciprocative movement therewith between said extended and said retracted positions, and

a collet member being disposed with said compression member for reciprocative movement therewith between said extended and said retracted positions, and having an engageable gripping means for gripping radially inwardly when engaged,

said compression member having a compressing means generally peripherally disposed about said gripping means for compressively engaging said gripping means when moving from said extended position to said retracted position



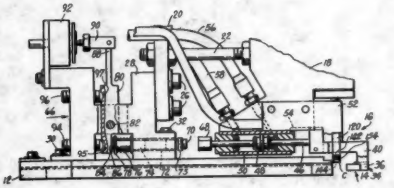
and for disengaging said gripping means when moving from said retracted position to said extended position, whereby a tube inserted in said gripping means is continuously extracted by the reciprocative movement of said gripping means from said extended position to said retracted position wherein said compressing means compresses said gripping means against the tube, and from said retracted position to said extended position wherein said compressing means disengages from said gripping means.

4,627,156

PLACEMENT HEAD FOR MICRO-COMPONENT ASSEMBLY MACHINE

Stanley R. Vancelette, Manchester, N.H., assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 565,749, Dec. 27, 1983, abandoned.
This application Nov. 19, 1985, Ser. No. 800,351
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—740 **6 Claims**



1. An apparatus for automatically positioning micro-electronic components on conductive lands of a printed circuit board, comprising:

a. a placement head including means for placing the components on the board;

b. an enclosed conveyor for transporting the components by air to said placement head linearly normal to said placement head;

c. means for receiving the components from said conveyor and positioning the components beneath said placement means;

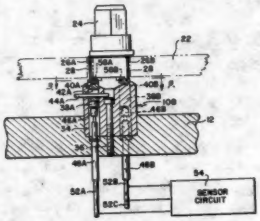
d. means for adjustably positioning said receiving means with respect to said placement means to accommodate variable sized components to assure each component is properly positioned on said placement means for placement on the conductive lands of the board;

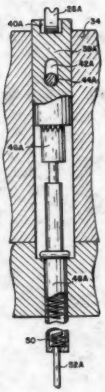
e. means limiting the adjusted position of said receiving means to a predetermined position to assure the accuracy of the position of the component beneath the placement means.

4,627,157
INSERTION VERIFICATION AND CRIMPING OF LEADS

Carl Campisi, Chicago; Abraham Lev, and Richard G. Schmid, both of Glenview, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Continuation of Ser. No. 614,349, May 25, 1984, abandoned.
This application Feb. 10, 1986, Ser. No. 828,584
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—741 7 Claims





1. In the mounting of an electronic component having a plurality of leads on a first side of a circuit board and in circuit with conductors positioned on a second side of said circuit board, said circuit board having a plurality of apertures therein through each of which a respective lead is inserted, apparatus for detecting the insertion of said leads through said apertures, for coupling each of said leads to a respective conductor, and for testing the electronic component following the mounting of the electronic component on said circuit board, said apparatus comprising:

support means;

a housing mounted to said support means and maintained in position adjacent the apertures in said circuit board on the second side thereof, said housing including a plurality of channels extending therethrough and aligned with a respective circuit board aperture;

a plurality of conductive crimping means, wherein each of said crimping means includes an elongated member linearly displaceable along and within a respective channel of said housing between a first proximal and a second distal end stop position relative to said circuit board and wherein each elongated member has a beveled distal end portion for engaging a respective component lead and positioning said lead in electrical contact with a conductor on the second side of said dircuit board;

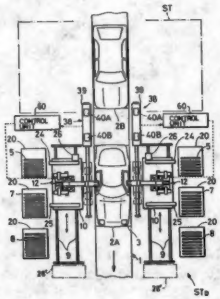
displacement stop means coupled to each of said elongated members for limiting the displacement thereof between said first proximal and said second distal end stop positions, wherein a distal end of a component lead is deflected laterally when a respective elongated member engaging said component lead is displaced toward said second distal end stop position, with said component lead then deflected toward said circuit board when said elongated member reaches said second distal end stop position so as to be positioned in electrical contact with a circuit board conductor; and

detector means coupled in circuit to each of said crimping means for detecting the engagement of each of said crimping means with a respective component lead, whereupon the electronic component is in circuit with said detector means for testing the operation of the electronic component following the mounting of the electronic component on the circuit board.

4,627,158
APPARATUS FOR SETTING DOORS TO VEHICLE BODIES

Syunji Mitoh, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Japan

Filed Aug. 5, 1985, Ser. No. 762,331
Claims priority, application Japan, Aug. 13, 1984, 59/169127; Aug. 13, 1984, 59/169128; Aug. 13, 1984, 59/169129
Int. Cl.[4] B23P *21/00, 19/00*
U.S. Cl. 29—771 17 Claims



1. Apparatus for setting a door to a vehicle body comprising;

a robot installed on a carriage movable along a vehicle body assembly line and operating with a predetermined working path to hold and carry a door,

a plurality of pallets arranged along a moving direction of said carriage for sorting and storing doors of plural different types thereon, and

door positioning means for positioning a door taken out by said robot from one of said pallets in proper relation to said robot,

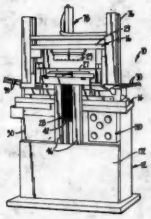
the apparatus being so constituted that when a vehicle body is conveyed to a door mounting station in said vehicle body assembly line, said robot picks out one of the doors sorted on said pallets, which is fit for said vehicle body conveyed or being to be conveyed to the door mounting station, to cause the same to engage with said door positioning means so that the door picked out by said robot is positioned by said positioning means, and then holds and carries the door positioned by said door positioning means to set the same to the vehicle body at the door mounting station.

4,627,159

APPARATUS AND METHOD FOR PROCESSING A SEMICONDUCTOR LEAD FRAME

Kurt Waldner, 12260 Saraglen Dr., Saratoga, Calif. 95170

Filed Oct. 1, 1984, Ser. No. 656,818
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—827 16 Claims



1. Apparatus for processing semiconductor lead frames comprising:

a support having first means on one side thereof for mounting a first stack of lead frames to be processed and second means on the opposite side thereof for receiving a second stack of lead frames after they have been processed;

means coupled with the first means for incrementally elevating a stack of lead frames, the second means being operable to allow processed lead frames to move into the second stack;

a pair of processing dies mounted near the upper end of the support, one of the dies being movable toward and away from the other die;

means coupled with said one die for shifting the same toward the other die to cause a lead frame in an operative position between the dies to be processed;

means mounted for reciprocation along a path extending between the dies for moving a lead frame from the first stack in one direction into said operative position between the dies for processing, said moving means being operable to advance a processed lead frame toward and into alignment with the second stack as said processed lead frame is moved in one direction, said moving means being movable in the opposite direction into a retracted position to place the moving means in position for shifting the uppermost lead frame of the first stack toward said operative position between; and

means coupled with said moving means for reciprocating the latter with respect to said dies.

16. A method of processing a plurality of semiconductor lead frames comprising:

moving the uppermost lead frame laterally off a first stack of lead frames and into a processing zone;

processing the first lead frame in said zone;

advancing said first frame to a position toward a second stack of lead frames, whereby the first lead frame can gravitate into the second stack when it becomes aligned therewith; and

repeating the moving, processing and advancing steps until all of the lead frames from the first stack have been processed and have been placed in the second stack.

4,627,160

METHOD FOR REMOVAL OF CARBONACEOUS RESIDUES FROM CERAMIC STRUCTURES HAVING INTERNAL METALLURGY

Lester W. Herron, Hopewell Junction; Ananda H. Kumar; Raj N. Master, both of Wappingers Falls, and Robert W. Nufer, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1985, Ser. No. 761,713
Int. Cl.[4] H05K *3/46*
U.S. Cl. 29—830 17 Claims

1. In a method of forming a glass-ceramic composite substrate wherein a slurry is prepared which includes sinterable particles of a crystallizable glass, an organic resin binder, and a solvent for the binder, forming the slurry into green ceramic sheets, forming via holes in the sheets, depositing electrically conductive material in the via holes and in line patterns on the surface of the sheets, assembling the sheets, and heating the assembly in an environment to oxidize and remove the resin binder, and subsequently heating the assembly at a higher temperature to fuse the glass particles, the improvement comprising,

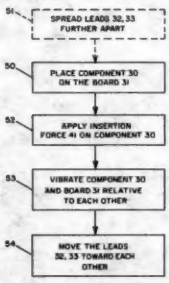
incorporating a catalyst to accelerate the binder oxidation of said slurry and eliminate carbonaceous binder residue, said catalyst selected from the group consisting of fine particles of Cu, Cu_2O, CuO, Cu_2SO_4, $CuCl_2$, Cu- organometallic compounds and mixtures thereof, in an amount in the range of 0.01 to 3.0% by weight of the said crystallizable glass, said catalyst capable of accelerating the oxidation and removal of said binder during said heating in the oxidizing environment.

4,627,161

METHOD FOR INSERTING MULTILEAD COMPONENTS INTO PRINTED WIRING BOARDS

Robert H. Cushman, Princeton, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Continuation of Ser. No. 562,956, Dec. 19, 1983, abandoned.
This application Jun. 24, 1985, Ser. No. 747,694
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—838 21 Claims


51
SPREAD LEADS 32, 33 FURTHER APART
50
PLACE COMPONENT 30 ON THE BOARD 31
52
APPLY INSERTION FORCE 41 ON COMPONENT 30
53
VIBRATE COMPONENT 30 AND BOARD 31 RELATIVE TO EACH OTHER
54
MOVE THE LEADS 32, 33 TOWARD EACH OTHER

1. A method for mounting a multilead component on a substrate having a plurality of apertures arranged in a pattern and adapted to receive the leads of said component, the method comprising the steps of:

placing the component with its leads on the substrate such that the pattern of said apertures is within the tip portions of said leads;

applying a force on the component in a direction substantially perpendicular to the plane of the substrate;

vibrating the component and the substrate relative to each other; and

laterally moving the tip portions of the leads inwardly toward the apertures while simultaneously vibrating the component and substrate relative to each other thereby

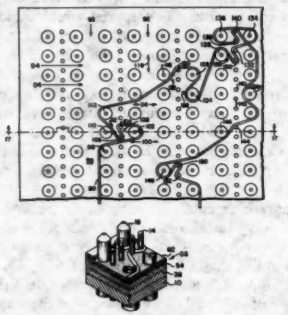
inserting each lead in a corresponding aperture in said substrate.

4,627,162

METHOD OF PRODUCING A WIRED CIRCUIT BOARD

Richard C. Holt, Fairhaven, Mass., assignor to Augat Incorporated, Mansfield, Mass.

Filed Nov. 4, 1983, Ser. No. 549,484
Int. Cl.[4] H05K *3/02*
U.S. Cl. 29—847 **23 Claims**



1. A method for producing a wired circuit board comprising the steps of:

routing a continuous insulated wire along a predetermined path through a plurality of pins projecting from a fixture plate;

adhering the continuous wire to an adhesive layer to form a wire mat;

severing the continuous wire at selected locations to form a wire mat having at least one wire net;

mating a circuit board having a plurality of conductive pads disposed on the board surface with the wire mat such that selected points of said wire nets confront selected conductive pads; and

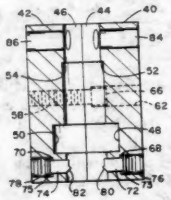
interconnecting said selected points of said wire nets with said selected conductive pads.

4,627,163

TUBE CUTTER FOR CUTTING TWO CONCENTRIC TUBES BULGED TOGETHER

Gary W. Cuba, Hopkins, and Edward N. Laughlin, Columbia, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 20, 1984, Ser. No. 632,978
Int. Cl.[4] B23D *21/06*
U.S. Cl. 30—95 **9 Claims**



1. A cutter mechanism for making a cut through a tube section having a circumferential bulge wherein said cut is to be made adjacent said bulge, said cutter mechanism comprising:

(a) an elongated housing being formed by at least two matable portions having first longitudinal matching recesses which define an axial bore through said housing having a first diameter extending from one end of said housing and a second diameter larger than the first diameter extending from the opposite end of said housing when said portions are mated together and having second transverse matching recesses which define a circumferential groove when said portions are mated together;

(b) means for clamping said portions together in a mating relationship which form said housing after said portions are assembled on said tube section such that said tube section extends through said axial bore and said bulge is contained within said circumferential groove;

(c) means defining a radial bore in at least one of said portions of said housing at one axial end portion of said housing between said circumferential groove and one terminal end of said housing, said radial bore extending radially from said axial bore of said housing;

(d) cutting means including at least one cutter bit being mounted in said radial bore of said housing and positioned adjacent the outer surface of said tube section when said housing is assembled on said tube section, said cutter bit being extendable into said axial bore to make a circumferential cut in said tube section upon rotation of said housing relative to said tube section; and

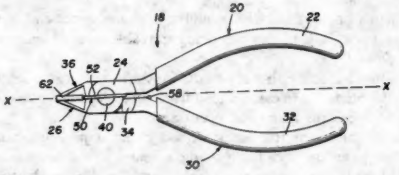
(e) means on said housing to facilitate rotation of said housing about said tube section for applying said cut, said means to facilitate rotation being located on an opposite axial end portion of said housing defined between said circumferential groove and the other terminal end of said housing.

4,627,164

WIRE STUB RETAINER AND HANDLE OPENING SPRING

Frank Mikic, Kenosha, and Daniel W. Williams, Milwaukee, both of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Feb. 19, 1985, Ser. No. 703,207
Int. Cl.[4] B26B *13/00*
U.S. Cl. 30—135 **6 Claims**



1. For use in a wire cutting pliers having first and second arms pivotally coupled at respective intermediate portions thereof and including respective cutting edges on first ends thereof, a resilient wire retainer comprising an intermediate mounting portion adapted to receive and grip the pivotally coupled intermediate portions of the first and second arms, for mounting thereon by gripping engagement therewith solely by reason of the shape of said intermediate mounting portion and without any other attachment means said mounting portion having opposed top and bottom portions for respectively engaging the pivotally coupled intermediate portions along the top and bottom thereof and opposed end portions for respectivey engaging the pivotally coupled intermediate portions along front and rear ends thereof, an elongated forward portion extending from said intermediate mounting portion and positioned immediately adjacent to and extending along the length of one of the cutting edges so as to engage and maintain a section of severed wire in firm contact with the other cutting edge when the cutting edges engage the wire, and an aft portion extending from the rear most part of said intermediate mounting portion substantially perpendicular to said top and bottom portions and terminating in a free distal end, said after

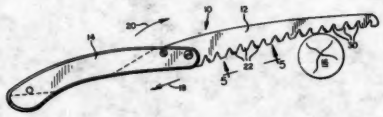
portion being positioned in abutting contact with one of the arms for biasing the pliers to an open configuration wherein the cutting edges are displaced from one another.

4,627,165

HAND HELD CUTTING TOOLS

Duane M. Gibson, Milwaukie, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Continuation of Ser. No. 583,983, Feb. 27, 1984, abandoned.
This application May 6, 1985, Ser. No. 730,266
Int. Cl.[4] B27B *23/00*
U.S. Cl. 30—166 R 7 Claims



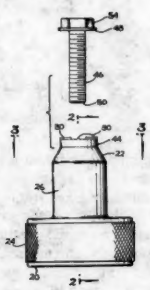
1. A hand saw for severing wood materials comprising; a handle and an elongated blade extended therefrom, said elongated blade having a bottom cutting blade edge designed for cutting by lengthwise reciprocation of the blade defining thereby a cutting direction, said cutting blade edge formed by a series of cutting teeth, the spacing between the teeth forming gullets for carrying wood chips, certain of said teeth having a depth seeking front surface and a depth controlling bottom surface cooperatively formed for controlled depth cutting of the wood material, said front surface and bottom surface intersecting to form a leading cutting edge having a leading cutting point, said depth controlling bottom surface being angled rearwardly and inwardly relative to the cutting direction from the cutting edge within a shallow angular range, and said bottom surface extending from said cutting edge a major portion of the distance between successive teeth with the length of the bottom surface and the length of the gullet having a ratio in the range of about 3 to 2 and greater, said controlling bottom surface being angled laterally and inwardly from one side edge to the other side edge, and said combination of angles and extended bottom surface providing operator control to controllably limit the depth of engagement of the preceding and succeeding cutting teeth.

4,627,166

WASHER CUTTER

William D. McMinn, 42215 52nd St. W., Quartz Hill, Calif. 93534

Filed Mar. 26, 1984, Ser. No. 593,671
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—277 8 Claims



6. A device for the removal of washers affixed to shafts of bolts comprising:

a handle for holding the device and supporting said bolts, said handle comprising a small diameter region at one end of said handle for supporting said bolt and a large diameter region for holding said device during operation, said large diameter region being knurled and of a size to be held in a user's hand;

a blade assembly removably coupled by coupling means to said small diameter region of said handle, said blade assembly having an outside diameter at least as large as the outside diameter of the washer to be removed; and an axially located opening for the insertion of the shaft of the bolt, said opening having a diameter slightly larger than the outside diameter than the shaft of the bolt, whereby the shaft of the bolt may be readily inserted into said opening; and

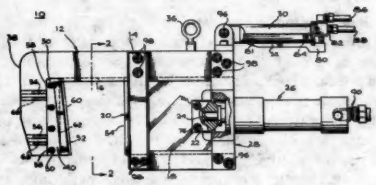
at least three substantially radially distributed blades on the surface of said blade assembly and extending from the diameter of said opening to at least the outer diameter of the washer, whereby said blades are in contact with the washer for a substantial portion of the width of the washer when the bolt bearing the washer is fully inserted in said opening.

4,627,167

LEG SHEAR

Ralph K. Karubian, and Gregorio J. Coelho, both of Los Angeles, Calif., assignors to Kentmaster Mfg. Co., Inc., Los Angeles, Calif.

Filed Jul. 1, 1985, Ser. No. 750,175
Int. Cl.[4] B26B *15/00*
U.S. Cl. 30—228 3 Claims



1. A leg shear including a frame having opposed upper and lower members and an anvil portion depending from said upper member, said opposed upper and lower members having opposed grooves in the edges thereof facing and parallel to each other;

a movable blade slidably carried in said opposed grooves and having a first rectilinear cutting edge normal to said grooves;

a fixed blade having a second rectilinear cutting edge, said fixed-blade being supported from said anvil portion with said second rectilinear cutting edge positioned facing said first rectilinear cutting edge and laterally displaced from alignment with said first rectilinear cutting edge a distance such that said movable blade makes sliding contact with said fixed blade when said first rectilinear cutting edge passes over said second rectilinear cutting edge during movement of said movable blade, said second rectilinear cutting edge lying in a plane parallel to the plane in which said first rectilinear cutting edge lies, and said second rectilinear cutting edge being non-parallel with said first rectilinear cutting edge;

said movable blade being supported throughout its travel by at least one of said opposed grooves;

a spacing plate supported in said frame in contiguous relation to said fixed blade and parallel to and aligned with said movable blade but recessed from said second rectilinear cutting edge;

said movable blade carrying at opposite ends of said first rectilinear cutting edge blocks having a flat surface

aligned with said first rectilinear cutting edge and with said spacing plate;

said spacing plate and said first rectilinear cutting edge being adjustable in position along the direction of the path of said movable blade.

4,627,168

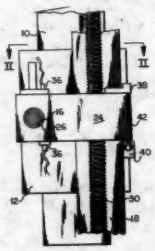
GAGE POSITION CONTROL

Stephen S. Maples, Adrian, Mich., assignor to Acer Automation, Adrian, Mich.

Filed Feb. 27, 1985, Ser. No. 706,443

Int. Cl.[4] G01B 7/02

U.S. Cl. 33—169 R **11 Claims**



1. Gage positioning apparatus comprising, in combination, a gage arm, gage arm support means supporting said arm for movement through an operative path, a protective shield having an opening defined therein receiving said gage arm, protective shield support means supporting said shield for movement through an operative path substantially corresponding to said gage arm operative path, power operated protective shield drive means operatively connected to said protective shield for moving said shield through its operative path, and sensing means sensing the relative position of said shield to said gage arm controlling said drive means preventing direct engagement of said shield with said gage arm wherein said shield is protectively associated with said gage arm without interfering with the movement thereof during gaging.

4,627,169

REMOTE CENTER COMPLIANCE DEVICE

Paolo R. Zafred, Pittsburgh, and Luciano Veronesi, O'Hara Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 27, 1986, Ser. No. 822,727

Int. Cl.[4] G01B 5/25

U.S. Cl. 33—169 C **11 Claims**

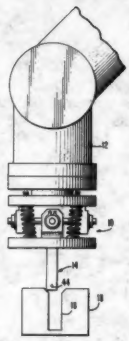
1. A remote center compliance device having a high degree of translational and rotational compliance for use in connection with a manipulator device comprising:

a first member adapted to be connected to said manipulator device;

a second member spaced from said first member; and

means interconnecting said first member with said second member for providing both rotational and translational compliance about a remote center of compliance external to said compliance device;

said interconnecting means including a pair of crossed, interconnected shafts, one of said shafts being connected to said first member and the other of said shafts being connected to said second member;



said interconnecting means further including a plurality of axially compressible and laterally deformable elements connected between said first and second members.

4,627,170

SHAFT GUIDE ALIGNMENT MEASUREMENT

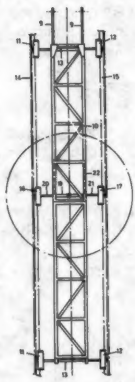
Ronald M. K. McKechnie, Vaal Reefs, South Africa, assignor to Vaal Reefs Exploration and Mining Co., Transvaal, South Africa

Filed Oct. 17, 1985, Ser. No. 788,446

Claims priority, application South Africa, Oct. 17, 1984, 84/8102

Int. Cl.[4] G01B 7/31

U.S. Cl. 33—181 R **9 Claims**



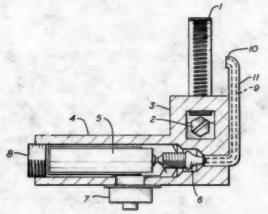
1. A conveyance guide alignment measuring device adapted to track along conveyance guides extending along a shaft comprising a substantially rigid frame, opposed roller assemblies at either end of the frame, the assemblies on one side of the frame being rigidly mounted on the frame for engagement with a reference guide and the assemblies opposed thereto on the other side of the frame being biased resiliently outwardly for engagement with a second guide, a sub-frame movably suspended from the frame and including a roller assembly rigidly mounted on the sub-frame for engagement with the reference guide and a roller assembly biased outwardly from the sub-frame for engagement with the second guide, and motion sensors mounted to detect and measure relative motion

of the frame, the sub-frame and the roller assemblies mounted on the sub-frame.

4,627,171
RETICLE ILLUMINATOR

Morris S. Dudney, 2001 E. Fifth St., Austin, Tex. 78702

Filed May 9, 1983, Ser. No. 493,033
Int. Cl.[4] F41G *1/32*
U.S. Cl. 33—241 **12 Claims**

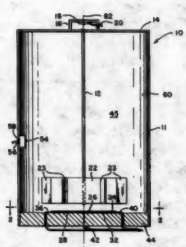


1. An attachment device for illuminating the reticle of a telescopic device through the eyepiece lens thereof, comprising: a housing; a light source enclosed in said housing and power source means also in said housing for actuating said light source; optical fiber means mounted to said housing, said optical fiber means having a first input end proximate said light source and a second output end located proximate the external side of said eyepiece lens for providing an illuminating light path from said light source to said reticle through said eyepiece lens; and means for removably positioning said housing on said telescopic device adjacent said eyepiece lens so that said second output end of said fiber optics means is adjacent said eyepiece lens.

4,627,172
INCLINOMETER HAVING TWO DEGREES OF FREEDOM

Martin A. Afromowitz, Seattle, Wash., assignor to Innovation Associates, Bellevue, Wash.

Filed Aug. 17, 1984, Ser. No. 641,790
Int. Cl.[4] G01C *9/06*
U.S. Cl. 33—366 **9 Claims**



1. An inclinometer comprising:

a housing means defining an internal chamber;

means for producing a light beam, wherein said means for producing a light beam are at least partially located within said chamber and have one end rigidly supported by said housing means; and

an optical detector means secured to said housing means and located to be adapted to receive a spot of light from said means for producing a light beam;

wherein at least a portion of said means for producing a light beam is free to move, with respect to its said rigidly supported end, in two degrees of freedom of motion under the influence of gravity in response to any inclination of said inclinometer, to enable the light beam it produces in operation to correspondingly move in two degrees of freedom of motion;

wherein said optical detector means has an at least substantially continuous light-sensitive surface area fashioned to measure the position of said spot of light when moving in said two degrees of freedom of motion;

wherein said optical detector means uniquely detects the position of said spot of light falling entirely anywhere on its said light-sensitive surface area regardless of the direction in which said spot of light moves on said light-senstive surface area;

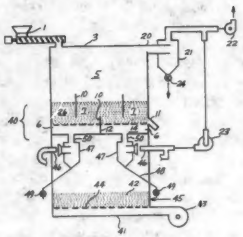
wherein said position of said spot of light falling on said light-sensitive surface area provides an indication, through the output signals generated by said optical detector in response to said spot of light, of the amount and direction of the inclination of said inclinometer;

wherein said means for producing a light beam comprise an optical rod and means for producing a light; wherein one end portion of said optical rod is rigidly secured to said housing; wherein said means for producing a light is secured to said housing means in a location to enable light it produces to be coupled to said optical rod; and wherein said optical rod is fabricated from an at least nearly perfect elastic material which is not appreciably affected by anelastic deformation.

4,627,173
FLUID BED HOG FUEL DRYER

Michael A. O'Hagan, Cupertino, and Richard D. Smith, Palo Alto, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 11, 1983, Ser. No. 483,973
Int. Cl.[4] F26B *3/08*
U.S. Cl. 34—10 **10 Claims**



1. A process for drying, in a fluid bed reactor, wet wood waste having a range of particle sizes to a substantially uniform moisture content, comprising:

feeding said wood waste into a first fluid bed treating zone;

fluidizing said wood waste in said first zone with a hot gas of sufficient velocity whereby the finest particle size portion of said waste is entrained in said gas and departs the fluid bed as said fines portion achieves a desired moisture content; establishing said desired moisture content of said material to avoid significant distillation of volatiles from said wood;

transporting said remaining wood waste in a fluidized state, now partially dried, to subsequent fluid bed treating zones;

adjusting the velocity of said fluidizing hot gases in each subsequent zone whereby the finest portion of the remaining wood waste in each zone is entrained and departs the fluid bed as each fines portion in each zone achieves the desired moisture content with the remaining partially dried material in a zone proceeding to the next treating zone;

discharging the final remaining portion of the wood waste from the fluid bed as it reaches the desired moisture content, and;

separating and collecting, simultaneously with the above steps, the entrained fines portion of wood waste from the fluidizing gas as it departs the fluid bed.

4,627,174
PROCESS AND SYSTEM FOR THE DRY QUENCHING OF COKE

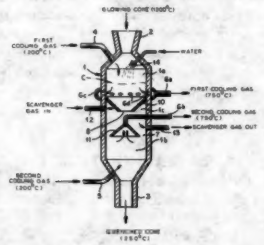
Kurt Hedden, Karlsruhe; Kurt-Günther Beck, Essen-Bredeney; Wolfgang Rohde, and Horst Schumacher, both of Essen-Heisingen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen-Krey, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 462,901, Feb. 1, 1983, abandoned. This application Apr. 19, 1985, Ser. No. 725,048

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203731; Feb. 4, 1982, 3203732

Int. Cl.[4] F26B *3/16*

U.S. Cl. 34—20 **4 Claims**



1. A process for quenching glowing coke in a plant in which the coke to be quenched is discharged from a coking chamber to be recharged with coal dried in a drying and preheating stage by direct contact with a hot gas picking up water vapor from the coal, comprising the steps of:

(a) feeding the glowing coke from above into a quenching duct divided into an upper and a lower compartment from which quenched coke is extracted at the bottom whereby said coke descends in said compartments and from said upper compartment to said lower compartment;

(b) passing a first flow of a cooling gas which is inert with respect to said descending coke in countercurrent to said coke through said upper compartment for reducing the coke temperature therein to a range between substantially 700° and 800° C. by direct contact of said cooling gas with said coke and withdrawing the first flow of gas from a lower portion of said upper compartment;

(c) passing a second flow of a cooling gas which is said hot gas obtained from said drying and preheating stage and containing water vapor after traversing said drying and preheating stage through said lower compartment in countercurrent to the descending coke for further reducing the temperature thereof to a level below substantially 300° C. by direct contact of said second flow of said cooling gas with said coke;

(d) laterally withdrawing said second flow of cooling gas, heated by said direct contact with the descending coke in said lower compartment at an upper portion of said lower compartment and recirculating the withdrawn second flow of gas through said drying and preheating stage as said hot gas and then back to said duct; and

(e) maintaining separation of said first and second flows of cooling gas from one another at a location corresponding substantially to a lower portion of said upper compartment and an upper portion of said lower compartment while permitting said coke to pass therebetween.

4,627,175
FLUIDIZED-BED APPARATUS

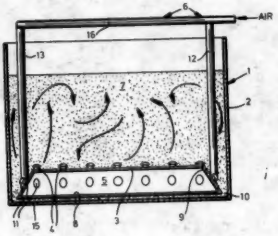
Ewald Schwing, Wiesfurther Str. 99, 4133 Neukirchen-Vluyn; Peter Sommer, Johann-Strauss-Str. 13, 4174 Issum 2, and Horst Uhrner, Schumannstr. 9, 4174 Issum, all of Fed. Rep. of Germany

Filed Nov. 1, 1984, Ser. No. 667,283

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 3340099

Int. Cl.[4] F26B *17/10*

U.S. Cl. 34—57 A **5 Claims**



1. In an apparatus for the fluidized-bed treatment of objects, which apparatus includes a housing having a floor and vertical circumferential wall means and defining interiorly thereof an upwardly open fluidized-bed chamber, a fluidizing-gas distributor compartment located in said fluidized-bed chamber and including a nozzle plate provided with a plurality of nozzles therethrough, and means for feeding fluidizing-gas into said fluidizing-gas distributor compartment, said nozzles serving to enable said gas to flow from said fluidizing-gas distributor compartment into said fluidized-bed chamber;

the improvement comprising that:

(a) said fluidizing-gas distributor compartment is an independent structure substantially corresponding in circumferential outline to said fluidized-bed chamber,

(b) said fluidizing-gas distributor compartment has a planar top wall constituting said nozzle plate and further has peripheral side walls and a bottom wall,

(c) said fluidizing-gas distributor compartment is removably positioned in said fluidized-bed chamber on said floor of said housing, and

(d) peripheral side walls of said fluidizing-gas distributor compartment converge toward one another from said bottom wall and said floor to said top wall of said compartment and are provided with additional nozzles through said side walls.

4,627,176
DRYING CYLINDER FOR A WEB MATERIAL MACHINE, PARTICULARLY A PAPER MACHINE

Francois Brieu, Saint-Cloud, France, assignor to Chleq Frote et Cie, Paris, France

PCT No. PCT/FR84/00242, § 371 Date Jun. 24, 1985, § 102(e) Date Jun. 24, 1985, PCT Pub. No. WO85/01969, PCT Pub. Date May 9, 1985

PCT Filed Oct. 24, 1984, Ser. No. 752,197

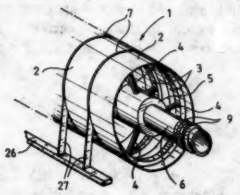
Claims priority, application France, Oct. 27, 1983, 83 17132

Int. Cl.[4] F26B *13/18*

U.S. Cl. 34—115 **18 Claims**

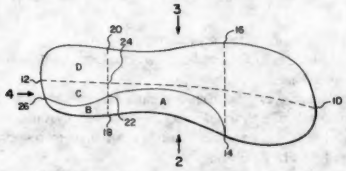
1. Drying cylinder designed for equipping a drier and/or after-drier for a machine producing material in webs, namely paper, the cylinder having two axial ends and a hollow structure internally heated and presenting a cylindrical outer side surface, circular in section, against which a web is to be applied, wherein the outer side surface is delimited by several cylindrical rims, circular in section, of the same radius and coaxially placed side by side, and made out of a good heat conducting material, each rim exchanging heat with an indi-

vidually controlled internal heating device that the rim surrounds, and each rim being integral in rotation with at least one hub fixed to at least one rotating shaft of the cylinder, wherein each rim is separated from a neighboring rim by a small axial



gap, and wherein the two axial ends of the cylinder are sealed and relatively gas-tight and wherein the inside of the cylinder is connected to a vacuum pressure source, so that the web is sucked against the rims through the axial gaps between the rims.

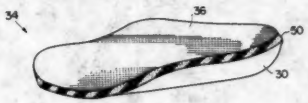
4,627,177
INSOLE STRUCTURE
Stuart R. Meyers, 2910 Wallace Ave., Bronx, N.Y. 10467
Continuation of Ser. No. 626,424, Jul. 2, 1984, abandoned, which is a continuation of Ser. No. 438,389, Nov. 1, 1982, abandoned.
This application Aug. 1, 1985, Ser. No. 761,662
Int. Cl.[4] A43B *13/38*
U.S. Cl. 36—43 **7 Claims**



1. A footwear insole member comprising a first portion the upper surface of which approximately underlies a substantial portion the area of the longitudinal arch and a second portion the upper surface of which underlies at least about 10% of the medial area of the heel and where the second portion extends through substantially the whole of the medial heel, contiguously beyond from about 0% to about 50% of the lateral area of the heel, said first and second portions being contiguous with each other and being contiguous with and less compressible than the remaining portions of said member, the edges of said first and second portions adjacent to said remaining portions undercutting said remaining portions at a downwardly sloping angle of up to about 85° from the vertical to form a wedge which, at its heel end terminus, is entirely in the medial portion of the heel.

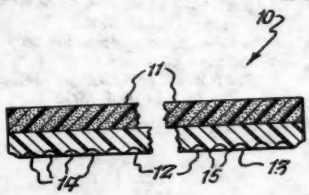
4,627,178
MOLDED SHOE INNERSOLE
James B. Sullivan, and Richard B. Fox, both of 60 Perseverance Way, Hyannis, Mass. 02601
Division of Ser. No. 470,638, Feb. 28, 1983, Pat. No. 4,581,187.
This application Sep. 18, 1985, Ser. No. 777,459
Int. Cl.[4] A43B *13/40*
U.S. Cl. 36—44 **9 Claims**

1. A molded shoe innersole for employment in footwear to provide support and cushioning to the foot, which innersole comprises a contoured heel and arch section having a generally flat, lower surface and a heel and arch, contoured top surface, the heel and arch sections contoured to provide a contoured arch section and a heel cup section composed of a molded, resilient, elastomeric, open-cell, polyurethane foam material of low compression set, and a top flexible sheet material having the general shape of a foot, the sheet material directly bonded in the molding process to the upper surface of the heel and arch section, said lower surface of the heel and



arch section extending forward of the arch section and gradually tapering into a thin diagonal line across the width of the sheet material and into the plane of the said bottom surface of the sheet material, the sheet material forming an exposed uniform edge about the top peripheral edge of the heel and arch section.

4,627,179
SHOCK ABSORBING INSOLE CONSTRUCTION
Benedict R. McElroy, Greencastle, Pa., assignor to Action Products, Inc., Hagerstown, Md.
Filed Jul. 10, 1985, Ser. No. 753,694
Int. Cl.[4] A43B *13/40*
U.S. Cl. 36—44 **15 Claims**



1. An insole construction comprising an upper layer of plastic material having a storage modulus of between about 500 and 2,000 psi/cycle and a lower layer of viscoelastic polyurethane material having a storage modulus of between about 10 and 85 psi/cycle and a specific gravity of between about 0.95 and 1.10.

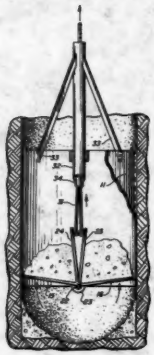
4,627,180
EXCAVATING BUCKET
Harold Learnahan, 4206 W. Melrose, Chicago, Ill. 60641
Filed Jan. 16, 1984, Ser. No. 570,778
Int. Cl.[4] B66C *3/02*
U.S. Cl. 37—184 **8 Claims**

1. An excavating device comprising:

a generally cylindrical casing having both an upper and a lower open end, each generally lying in a plane perpendicular to the axis of the casing, said casing at said lower open end being generally tapered;

a blade assembly including hinging means rotatably mounted along the diameter of said casing at the lower open end of the casing, said assembly including a first and a second blade, each of said blades having a cutting part and a bulkhead part and a first and second surface means to simultaneously rotate said blades in opposite directions about said hinging means from a lower position in which said blade assembly extends downwardly generally perpendicular to the plane of said lower open end with said second surfaces juxtaposed and the bottom of said casing is open, to and from an upper position in which said blade assembly forms a substantially flat plane substantially

closing the bottom of said casing and the first surface of each blade faces inward from the lower end of said casing,



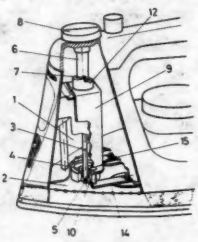
and the second surface of each blade faces outward from the lower end of said casing.

4,627,181

FLOW REGULATING VALVE FOR STEAM IRON STEAM CHAMBER

Tomas Bastida, Eibar, Spain, assignor to Ofcina de Investigacion Agrupada, S.A., Eibar, Spain

Filed Nov. 26, 1984, Ser. No. 674,575
Int. Cl.[4] D06F *75/18*
U.S. Cl. 38—77.7 **7 Claims**



1. A valve for controlling the flow of water from a water reservoir to a steam generating chamber, comprising:

a closing shaft having a lower end for seating in a hole in said steam generating chamber;

a shaft carrying member affixed to the upper end of said closing shaft.

a projection extending radially from said shaft carrying member;

an external control affixed to said shaft carrying member for rotating said shaft carrying member and projection;

a displaceable bridge-shaped member positioned outside said water reservoir and spaced apart from said shaft carrying member, said bridge-shaped member having two legs, and said shaft extending through said bridge-shaped member and between said legs;

a contour cam adjacent said bridge-shaped member and through which said shaft and shaft carrying member pass, said contour cam having a first slanted surface along its circumference upon which said projection may rest;

a spring fixed to said external control and said shaft for urging said shaft into said hole; and

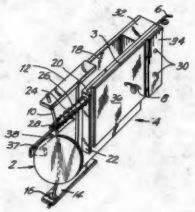
two bimetallic elements sensitive to predetermined temperature changes, each of said elements being located on said steam generating chamber, symmetrically positioned with respect to said closing shaft, and below a leg of said bridge-shaped member such that when the bimetallic members reach a predetermined temperature, they exert upward pressure against the legs of said bridge-shaped member and raise said bridge-shaped member toward said shaft carrying member thereby permitting a flow of water from said reservoir to said steam generating chamber.

4,627,182

BI-STABLE DISPLAY DEVICE

Gerhart Weiss, Flushing, N.Y., assignor to Tempo Instrument Incorporated, Commack, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,923
Int. Cl.[4] G09F *3/04*
U.S. Cl. 40—447 **47 Claims**



1. A display device comprising:

display means having at least two surfaces of different visual appearance;

piezoelectric crystal drive means having at least one end fixed relative to the display means, the crystal drive means having a region which can be displaced in response to an applied voltage; and

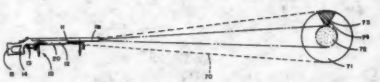
coupling means for converting displacement of the drive means in the rotation of the display means so as to position one of the surfaces for viewing.

4,627,183

FIREARM WITH AIMING LIGHT

Lowell R. Stuckman, 1315 Cuatro Cerros Tr. SE., Albuquerque, N. Mex. 87123

Filed Apr. 11, 1985, Ser. No. 721,946
Int. Cl.[4] F41G *1/34*
U.S. Cl. 42—1.01 **13 Claims**



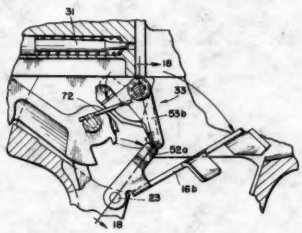
1. A firearm including in combination a barrel having a discharge end, an aiming light assembly secured with said barrel to project a visible light beam along said barrel beyond said discharge end of said barrel in intersecting relationship with said barrel to impinge on and produce a lighted area on a target circumscribing an impact area of a shot pattern from said firearm on said target and to produce an aiming shadow from said discharge end of said barrel substantially triangular in shape and having an apex pointing at said shot pattern, and means for turning said light assembly "on" and "off".

4,627,184

EJECTOR MANUALLY OPERABLE TO ROTATE FIRING PIN BLOCK FOR SLIDE REMOVAL AND DISASSEMBLY

William B. Ruger, Croydon, N.H., and Lawrence L. Larson, Branford, Conn., assignors to Sturm, Ruger & Company, Inc., Southport, Conn.

Filed Oct. 16, 1984, Ser. No. 661,522
Int. Cl.[4] F41C *15/06*
U.S. Cl. 42—25 7 Claims



2. In a semi-automatic firearm having a frame, a reciprocating slide, a magazine, a cartridge, a cartridge ejector port, a firing pin mounted for reciprocal movement in the slide as urged toward the cartridge by its momentum as the slide reciprocates and away from the cartridge as urged by a spring, a rotatable firing pin blocking piece mounted on the frame, the improvement comprising

(a) an elongated cartridge ejector means including a base portion pivotally mounted on the frame and a stem portion extendable into the cartridge ejection port for ready engagement by the hand of the firearm operator through the cartridge ejection port;

(b) positioning means on the frame and on the ejector base portion for holding the ejector means in two (2) distinct positions; a first position in which the stem portion is positioned in the cartridge ejection port for ejecting cartridges during operation of the firearm and a second position; and

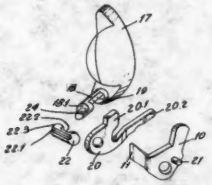
(c) extension means on the ejector means for engagement with the firing pin blocking piece to cause the blocking piece to rotate to unblock the firing pin when the ejector means is moved to such second position.

4,627,185

SAFETY HAMMER LOCK FOR A HAND WEAPON

Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,907
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1984, 3402007
Int. Cl.[4] F41C *17/04*
U.S. Cl. 42—66 16 Claims



9. In a revolver having a revolver frame formed with a grip and a barrel, a trigger swingable about an axis perpendicular to an axis of the barrel, a cock swingable about an axis parallel to the trigger axis, a cylinder having a plurality of cartridge chambers rotatable on said frame about an axis parallel to said barrel, and a cylinder cover flap swingable adjacent an end of said cylinder turned away from said barrel between a closed position wherein said chambers are inaccessible and an open position wherein at least one of said chambers is accessible for loading, the improvement which comprises a safety mechanism, said safety mechanism comprising:

a locking member shiftable transversely to said cock and confronting a flank thereof forming a stop for said member, said flank being formed with a recess receiving said member for immobilizing said cocks; and

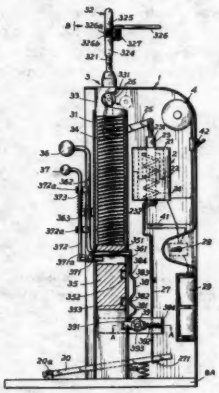
a shaft connected to said flap and rotatable in said frame with said flap, said shaft being operatively connected to said member whereby said flap is prevented from pivoting into said open position unless said recess registers with said member and swinging of said flap into said open position immobilizes said cock, said locking member being formed with a groove defined between two surfaces and said shaft has an axially extending finger projecting into said groove and engageable with said surfaces to shift said member.

4,627,186

AUTOMATIC FISHING MACHINE

Jeng-Maw Wang, P.O. Box 10160, Taipei, Taiwan

Filed Nov. 12, 1985, Ser. No. 797,414
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—16 7 Claims



1. An automatic fishing machine comprising:

a casing (1) mounted on a base BA:

an actuating means (2) formed in said casing (1) and including an electromagnet switch (21), electrically connected with a normal-open microswitch (28) and a power source (29);

a rod-biasing means (3) formed in the rear side of said casing (1) and including a rod clamp (32) for clamping the grip of the fishing rod (F) and operated by said actuating means (2) to raise said fishing rod when bitten by a fish;

an alarm (4) including a manual switch (42) and a contactor switch (41) electrically closed by said electromagnet switch (21), and electrically connected with said micro switch (28) and said power source (29);

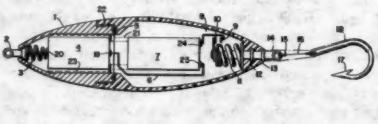
and a fulcrum means (5) formed on the front portion of said casing (1) for supporting said fishing rod (F) and serving as a fulcrum for said rod (F), wherein said micro switch (28) of said actuating means (2) wound by the fishing wire (W) between the reel (R) and the bait (BT) will be triggered to actuate the electromagnet switch (21) to operate said rod-biasing means (3) to automatically raise the fishing rod (F) for hooking up the biting fish, and to sound the alarm (4) to remind the fisherman to hold the fishing rod to pick up the hooked fish.

4,627,187

FISH STUNNING ASSEMBLY

Theodore M. Williams, 1360 Keneki Pl., Hilo, Hi. 96720

Filed Jun. 10, 1985, Ser. No. 742,959
Int. Cl.[4] A01K *79/02, 85/00*
U.S. Cl. 43—17.1 2 Claims



1. A high voltage underwater fish stunning assembly, comprising an elongated cylinder tapered at the ends and connected to a fishing line at one end, an insulated leader wire and partially insulated hook extending from the other end of the assembly, an electric high voltage booster inside the cylinder, a dry cell storage battery arranged to supply electricity to said electrical high voltage booster, a movable shaft with a connecting eye at one end secured to said leader wire, a pair of contact points, one of said contact points being movable and supported by the other end of said shaft, the other contact point of said pair being connected to said high voltage booster, a spring on said shaft biasing the movable contact to an open position against the pull of the leader wire, whereby closure of the contact points closes a circuit that allows a surge of the stored high voltage electricity to surge thru the shaft leader wire and hook rendering the fish unconscious.

4,627,188

FISHING ROD ASSEMBLY

Regino V. Razote, 6747 Birch Trace, Pineville, La. 71360

Filed Nov. 12, 1985, Ser. No. 797,124
Int. Cl.[4] A01K *89/017*
U.S. Cl. 43—21 11 Claims

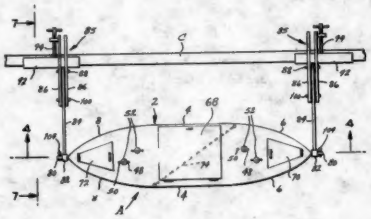
1. A fishing rod assembly comprising:
(a) reel mount means having a rod mount base at one end and a handle base at the opposite end;
(b) hollow, flexible, elongated rod means carried by said rod mount base of said reel mount means;
(c) a handle carried by said handle base of said reel mount means, and switch means cooperating with said handle;
(d) an electric motor in electrical cooperation with said switch means and spool means in driven relationship with said electric motor, with said electric motor and said spool means removably carried by said reel mount means for extending and retrieving a fishing line wound on said spool means and projecting through said rod means when said electric motor and said switch means are connected to a source of electric current; and
(e) a housing enclosing said electric motor and said spool means, with front and rear end caps closing said housing, respectively, and a front aperture in said front end cap to provide access for the fishing line, and a rear aperture in said rear end cap to provide access for electric wiring to energize said electric motor.

4,627,189

PORTABLE LIVE WELL

Harold G. Pippin, and Hilma M. Pippin, both of R.R. 1, Box 97A, Brighton, Mo. 65617

Filed Jun. 24, 1985, Ser. No. 747,804
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—55 22 Claims



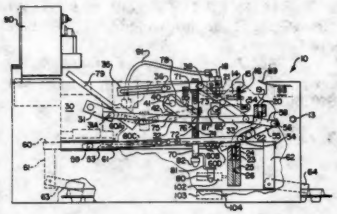
1. A live well apparatus comprising: a hull adapted for placement in a body of water and having spaced apart upright ends and at least one interior compartment for holding water and fish within the water, the hull having at least one port for providing communication between the compartment and the exterior of the hull and being located such that when the hull is in an upright orientation in the body of water, water may enter the compartment through the port; a valve located at the port for closing the port; bracket means configured and adapted to be attached firmly to the gunwale of a small boat; swing arms pivotally connected to the hull at the ends of the hull and to the bracket means to enable the hull to be moved in the upright orientation between an outside position, wherein it is located outside of the boat to the side of the gunwale, and a stored position, wherein it is located generally within the boat, the swing arms rotating and passing through an upright position as the hull moves between its outside and stored positions.

4,627,190

APPARATUS FOR PLANTING SEED IN SEED GERMINATING TRAY

James K. Little, Rte. 6, Box 488, Concord, N.C. 28025

Filed Jul. 19, 1984, Ser. No. 632,324
Int. Cl.[4] A01C *00/00*; A01G *00/00*; B23Q *7/04*; B65G *59/00*
U.S. Cl. 47—1 A 4 Claims



1. An apparatus for planting seed row-by-row in a compartmented seed germinating tray, comprising:
(a) a seed hopper;
(b) a plurality of vertically disposed seed holding vacuum nozzles, each having a tip adapted to receive and hold a seed by means of vacuum applied through the nozzle and mounted for translation reciprocating motion between a vertical seed receiving position in said seed hopper and a laterally spaced-apart vertical seed discharge position wherein a seed is released from each of the nozzles and conveyed through an aperture in a seed delivery bar to the tray for discharge into respective compartments;

(c) a plurality of soil punchers for forming a seed-receiving depression in the soil of each of a plurality of compartment in a row of the tray in advance of receiving a seed therein, said seed delivery bar including means for positioning the exit point of the seeds to permit an accurate discharge of seed in closely spaced-apart relation into a tray having a relatively shallow depth and in a tray having a relatively greater depth, and wherein said plurality of soil punchers includes readily removeable extension soil punches for being connected to and extending downwardly from the plurality of soil punchers for forming a seed-receiving depression in the bottom of a tray having a relatively shallow depth with said extension soil punchers thereon and in trays having a relatively greater depth with said extension soil punchers removed;

(d) tray moving means for moving the tray forward to align an empty row of compartments in seed-receiving relation after each reciprocation of said seed holding vacuum nozzles and for moving a seeded tray out of seeding position and moving another tray into seeding position, said tray moving means including;

(i) said apparatus defining a void through said apparatus from an unseeded tray entrance to a seeded tray exit;

(ii) a tray entry trigger mounted adjacent the tray entrance on one end of a tray carrier arm;

(iii) a tray exit trigger mounted adjacent the tray exit on the other end of said tray carrier arm;

(iv) said tray carrier arm mounted for translational, reciprocating forward and rearward movement, the forward movement of said tray carrier arm causing said tray entry trigger and said tray exit trigger to move forward and thereby move the tray forward by engagement with either one or both of the tray entry trigger or tray exit trigger, depending on the location of the tray within said apparatus and during the rearward movement of said tray carrier arm, said tray entry trigger and said tray exit trigger moving rearwardly to one or the other or both engage a next row of tray compartments depending on the location of the tray or trays within said apparatus; and

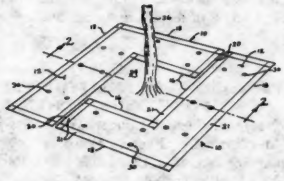
(e) a drive means and a linkage means mechanically communicating said tray moving means, said vacuum nozzles, said seed delivery bar, and said soil punches for operating the apparatus in a sequenced and coordinated manner.

4,627,191

ARTICLE FOR TREATING SOIL AROUND GROWING PLANTS

Emric W. Bergere, 7250 Frankline Ave., Los Angeles, Calif. 90046

Filed Aug. 5, 1985, Ser. No. 762,523
Int. Cl.[4] A01G *17/00*
U.S. Cl. 47—25 **1 Claim**



1. A package containing soil conditioning agents, the package being adapted to be placed adjacent the stem of a plant and comprising:

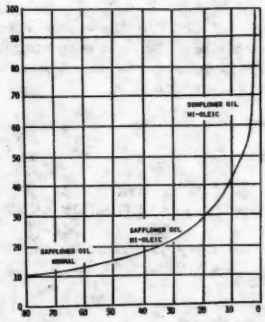
a pair of confronting flexible, flat panels of at least initially moisture impermeable material joined along their peripheries by a continuous bond to define a sealed chamber containing the soil conditioning agents, the package being substantially flat and the panels defining surfaces so that in use the package shelters the root system of the plant against over-watering and inhibits weed growth, the confronting panels being adapted to be pierced by the user so as to predetermine the rate of release of the soil conditioning agents from the package, the panels being L-shaped whereby a pair of said packages may be placed in abutting, complimentary relationship to define a central opening for the plant stem, the area of each of the panels comprising four square units of equal area, the units being arranged in a three-by-two pattern facilitating the manufacture of said packages from a continuous web of panel material without waste.

4,627,192

SUNFLOWER PRODUCTS AND METHODS FOR THEIR PRODUCTION

Gerhardt N. Fick, Breckenridge, Minn., assignor to Sigco Research Inc., Breckenridge, Minn.

Filed Nov. 16, 1984, Ser. No. 672,359
Int. Cl.[4] A01H *1/02*
U.S. Cl. 47—58 **62 Claims**



1. A sunflower seed having an oleic acid content of approximately 80% or greater, relative to the total fatty acid content of said seed, and a ratio of the amount of linoleic acid in said seed to the amount of oleic acid in said seed of less than about 0.09.

4,627,193

REVOLVING DOOR CONTROL SYSTEM

Milan Schwarz, 1370 Canyon View Dr., LaVerne, Calif. 91750

Continuation-in-part of Ser. No. 533,983, Sep. 20, 1983, abandoned. This application Mar. 15, 1985, Ser. No. 712,557
Int. Cl.[4] E05D *15/02*
U.S. Cl. 49—42 **45 Claims**

1. A control for a security door of the type having a housing with an entrance and an exit, a member rotatably disposed in the housing and having a plurality of wings which, in cooperation with the housing, define at least one compartment movable between the entrance and exit in response to rotation of the member, the control comprising:

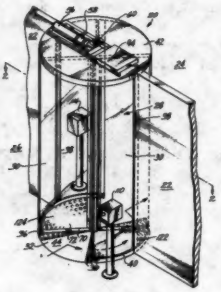
means for enabling the member for rotation to move a selected compartment from the entrance to the exit in response to identification of an authorized person;

means for generating pulses as the selected compartment moves between the entrance and exit, each pulse representing an increment of movement for the selected compartment;

means for determining the position of the selected compartment from the pulses;

means for sensing persons or objects in said selected compartment at at least one region between the entrance and exit, the sensing means generating a signal indicative of such persons or objects; and

means for comparing the position of the selected compartment with the signal to indicate the passage of an authorized individual through the region, the comparing means issuing a command to prevent further rotation of the



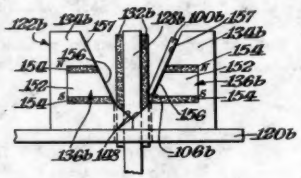
member and motion of the selected compartment when the position of the selected compartment and the signal indicates the presence of a second, unauthorized person or object in said region.

4,627,194

METHOD AND APPARATUS FOR KNIFE AND BLADE SHARPENING

Daniel D. Friel, Box 4319, Greenville, Del. 19807

Filed Mar. 12, 1984, Ser. No. 588,794
Int. Cl.⁴ B24B 9/00
U.S. Cl. 51—58 **17 Claims**



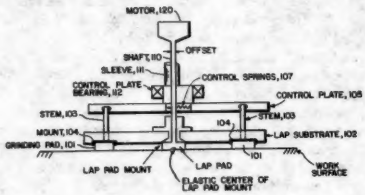
1. A knife sharpening apparatus for sharpening a knife having a face terminating at a cutting edge facet comprising an abrasive surface, drive means operatively connected to said abrasive surface for imparting a motion to said abrasive surface, magnetic knife guide means having a magnetic guide surface in a plane disposed at a predetermined angle to and intersects said abrasive surface to form a line of intersection therewith, said magnetic knife guide surface having two opposite polarity magnetic poles comprising a north pole and a south pole, oriented such that each pole lies along a line which is substantially parallel to said line of intersection one of said north and said south poles being disposed along a portion of said magnetic guide surface which is remote from said abrasive surface and the other of said north and said south poles being disposed along a portion of said magnetic guide surface which is contiguous to said abrasive surface to create a magnetic field at said abrasive surface, said magnetic field being of a strength to provide a thrust to move the cutting edge facet into contact with said abrasive surface and a force to hold the cutting edge facet in contact with said abrasive surface while said abrasive surface is in motion.

4,627,195

COMPUTER CONTROLLER OPTICAL SURFACING (CCOS) LAP PRESSURE CONTROL SYSTEM

Allen H. Greenleaf, Pownal, Me., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 18, 1985, Ser. No. 777,141
Int. Cl.⁴ B24B 7/00
U.S. Cl. 51—119 **3 Claims**



1. A rotary lapping system capable of generating a controlled pressure gradient including positive and negative lift when lapping a workpiece which is coated with an abrasive slurry liquid, said rotary lapping system comprising:

a rotating means;

a shaft connected to and being rotated by said rotating means;

a lap substrate connected to and rotated by said shaft;

a plurality of adjustable grinding pads mounted beneath and being rotated by said lap substrate, and adjustable grinding pads generating positive lift when rotated in said abrasive slurry liquid with a positive angle of attack, said adjustable grinding paths generating a negative lift when rotated in said abrasive slurry liquid with a negative angle of attack, and wherein each of said plurality of grinding pads comprises a grinding pad mounted beneath said lap substrate, said grinding pad having a grinding surface on its bottom which is presented to the workpiece, and an upwardly extending stem on its top which passes through the lap substrate to the adjusting means, said stem tilting the grinding pad at positive and negative angles of attack when tilted by said adjusting means;

a means for mounting each of said plurality of adjustable grinding pads to said lap substrate;

a control plate fixed on the shaft above the lap substrate and rotating with the lap substrate, said control plate having a plurality of notches into which each stem from said plurality of adjustable grinding pads is inserted; and

a plurality of adjustable control springs, each mounted in one of the notches of the control plate and holding the stem of an adjustable grinding pad in an adjustable position to tilt the adjustable grinding pad into the variable angles of attack including: positive angles of attack, a neutral angle of attack, and negative angles of attack.

4,627,196

PRESSURE-COMPENSATED HYDRAULIC POSITIONING SYSTEM

John P. Veale, Snohomish County, Wash., assignor to Western Gear Machinery Co., Everett, Wash.

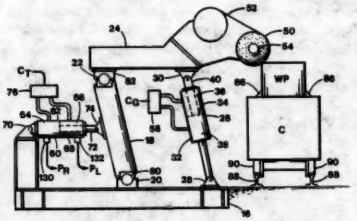
Division of Ser. No. 455,212, Jan. 3, 1983, Pat. No. 4,490,944.
This application Sep. 7, 1984, Ser. No. 648,365
Int. Cl.⁴ B24B 1/00
U.S. Cl. 51—281 R **4 Claims**

1. A method of controlling the transverse position of a grinding wheel across a workpiece surface in accordance with a postion command, said grinding wheel being transversely moved by a hydraulic actuator having a cylinder divided into two chambers by a piston that moves responsive to differential pressure thereacross to control the transverse position of said grinding wheel, the flow of fluid into and out of said hydraulic actuator being controlled by an electrically controlled valve in

accordance with a control signal applied to its control input, said method comprising:

determining the transverse position of said grinding wheel;

comparing the transverse position of said grinding wheel to said position command to generate a position error;



determining the differential fluid pressure across the piston of said hydraulic actuator; and

generating said control signal as the difference between said position error and a value derived from the differential fluid pressure across said piston.

4,627,197

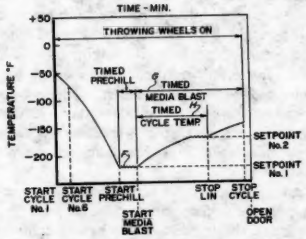
PROCESS CONTROL FOR CRYOGENIC DECOATING

David J. Klee, Emmaus; Thomas W. Burke, Allentown, both of Pa., and Scott A. Miller, Lexington, Mass., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 8, 1983, Ser. No. 559,522

Int. Cl.[4] B24C *1/00*

U.S. Cl. 51—319 **14 Claims**



1. In a process for removal of bonded coatings from articles by chilling the articles in a closed treating chamber to effect embrittlement of the coatings thereon and subjecting the chilled articles in said chamber to high velocity impact by blasting media centrifugally hurled thereon by a rotating bladed impeller, the improvement which comprises the cycle sequence:

(a) initiating the process cycle by subjecting the coated articles to a cooldown stage in an initial environment of cryogenic fluid until a preset lowest temperature level is attained within said initial environment;

(b) continuing exposure of said articles at said first preset temperature level for a fixed present time period to assure pre-chilling of said articles to below embrittlement temperature of the coatings thereon;

(c) at the expiration of said pre-chilling time period, initiating impact of the articles with the blasting media;

(d) while continuing said impact, subjecting said articles to a controlled warming temperature environment until the warming environment reaches a second preset temperature level and when the second preset temperature level is attained continuing said impact at substantially said second preset temperature level for the remainder of a fixed time period measured from the time of initiation of impact with the blasting media;

(e) at the expiration of the remainder of said last-mentioned fixed time period, discontinuing continuous injection of cryogenic fluid into said cryogenic environment while maintaining exposure of said articles to temperatures proximate that of said second preset temperature while continuing impact with blasting media to the end of said treating cycle;

(f) and thereafter discharging the thus treated decoated articles from the treating chamber.

4,627,198

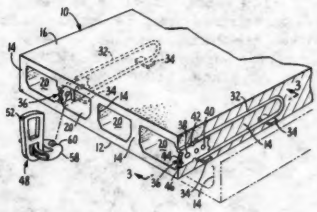
HOISTING ANCHOR ASSEMBLY FOR USE IN CAST CONCRETE PANELS AND METHOD

Sidney E. Francies, III, San Mateo, Calif., assignor to The Burke Company, San Mateo, Calif.

Filed Sep. 17, 1984, Ser. No. 651,282

Int. Cl.[4] E04B *21/2*

U.S. Cl. 52—125.5 **11 Claims**



1. An anchor assembly to be embedded in a cast panel member, said anchor assembly comprising:

anchor head means for receiving a hoisting unit;

anchoring means for anchoring said anchor head means in the panel member, said anchoring means including an arcuate elongated member having an outside bottom surface and first and second ends rigidly secured to said anchor head means; and

support means for supporting said elongated member in a first plane, said support means including at least one plate fixed to the outside bottom surface of said elongated member and extending generally transverse to said first plane.

4,627,199

TACKABLE ACOUSTICAL STRUCTURE

Raymond W. Capaul, Rte. #3, Wildwood Dr., Box 643, Aurora, Ill. 60504

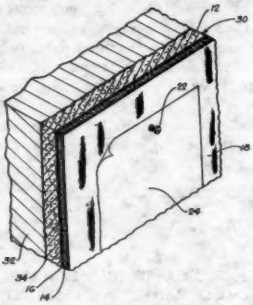
Filed Sep. 24, 1984, Ser. No. 653,364

Int. Cl.[4] B32B *17/06*; E04B *1/82, 1/84*; E04C *2/26*

U.S. Cl. 52—145 **5 Claims**

1. A tackable acoustical structure, consisting essentially of: a layer of tack pin retaining material formed of compressed wood fiber; a layer of a sound absorption material formed of compressed glass fibers or rock wool; and a continuous, thin film of a tack pin penetrable metal foil between and abutting both the tack pin retaining layer and the sound absorption layer, wherein a substantially fire-resistant decorative facing is provided on the exposed surface of the sound absorption layer, the sound absorption layer and the film of metal foil being characterized in that their combined thickness is such that the

pin of a tack can pass therethrough and enter the tack pin retaining layer thereby enabling a tack to be firmly, yet releasably, secured on the structure, the tackable acoustical structure having a flame spread index below about 25.

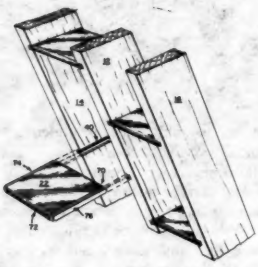


4,627,200

RECESSED MORTISE STAIR

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Mar. 5, 1984, Ser. No. 586,099
Int. Cl.[4] E04F *11/00*
U.S. Cl. 52—191 14 Claims



1. A stair comprising:

a central stringer having first and second sides, a front edge and a rear edge and adapted for mounting between an upper level and a lower level at a specified angle of inclination, said central stringer having a plurality of substantially horizontal recessed dovetail mortises disposed in alternating arrangement on respective sides of the stringer and extending substantially from said front edge to said rear edge;

side stringer disposed on respective first and second sides of the central stringer, each side stringer having a central stringer facing side, a front edge and a rear edge, and at least one substantially horizontal recessed dovetail mortise in the central stringer facing side extending substantially from the respective side stringer front edge to the rear edge in corresponding opposed relation to the central stringer recessed mortises; and

a plurality of tread members, at least one of said tread members having opposing ends of a defined length with dovetail tenons extending therefrom along substantially the entire length of the respective ends, the tread member ends being slidably disposed in the respective central and side stringer recessed mortises to interlock the respective central and side stringers in fixed spatial relation and maintain the tread members in alternating arrangement on respective sides of the central stringer;

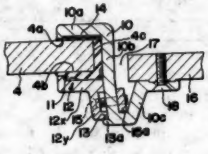
wherein each of the central and side stringer recessed dovetail mortises includes a substantially rectangular recess defining upper and lower shoulders, and each dovetail mortise is centrally disposed with respect to the recess.

4,627,201

WINDOW STAY

Atsushi Hamamoto, Hyogo, and Yoshio Kawaoto, Gifu, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha and Alna Koki Co., Ltd., both of Hyogo, Japan

Filed Jul. 25, 1984, Ser. No. 634,363
Claims priority, application Japan, Jul. 27, 1983, 58-138584
Int. Cl.[4] E06B *3/00*
U.S. Cl. 52—208 4 Claims



1. A window stay which comprises:

a frame member having an abutment flange for contact with the peripheral edge portion of a panel member;

a panel retaining member adapted to be secured firmly to the frame member in a manner with the peripheral edge portion of the panel member sandwiched tightly between it and the abutment flange;

an elastic cushioning member encircling the peripheral edge portion of the panel member and sandwiched between the panel retaining member and the abutment flange together with the peripheral edge portion of the panel member, said elastic cushioning member so positioned as to be inwardly compressed to provide fluid tightness in addition to the cushioning effect derived from its own resilience, said elastic cushioning member comprising an elastic cushioning strip made of resilient material and an elastic adhesive strip, said adhesive strip being applied to the abutment flange prior to a glass plate being mounted in the frame member; and

a rim projection provided on the frame member for avoiding any possible displacement of the panel retaining member relative to the frame member by the action of a reactive force exerted by the compressed elastic cushioning member, a circumferential surface of said panel retaining member being slightly greater than that of the rim projection.

4,627,202

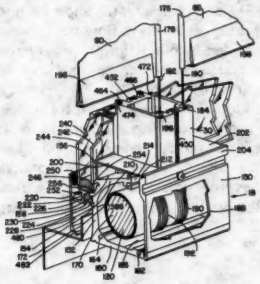
STRUCTURAL ELEMENT ESPECIALLY SUITABLE FOR SOLAR CONTROLLING AND THE LIKE AND PARTICULARLY UTILIZABLE FOR CONTROLLING SHADING

Christopher Esposito, West Bay Shore, N.Y., assignor to Four Seasons Solar Products Corp., Farmingdale, N.Y.

Division of Ser. No. 455,475, Jan. 4, 1983, Pat. No. 4,596,093.
This application Mar. 5, 1985, Ser. No. 708,500
Int. Cl.[4] E06B *7/14*
U.S. Cl. 52—209 16 Claims

1. A solar greenhouse construction comprising glazing, support means to support said glazing in a combination to define an at least partly enclosed space, said glazing being permeable to solar radiation to allow said radiation to pass into said space, and shade means in said space and adapted for being positioned adjacent at least part of said glazing to intercept at least part of the radiation passing through said glazing, said support means being provided with at least one track channel in which the shade means in engaged and by which the shade

means is guided along said glazing, said solar greenhouse construction further comprising a horizontal base sill including a sloped upper wall and a vertical wall extending along and upwardly from the sloped wall to define a moisture drain



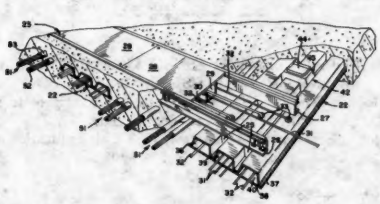
therewith, said support means including vertical bars supporting said glazing and including angled lower extremities accommodated in the drain formed by said sloped upper wall and vertical wall, said lower extremities and drain having matching profiles.

4,627,203

POST-TENSIONED FLOOR WITH IN-FLOOR DISTRIBUTION SYSTEM

Hoshang H. Presswalla, Wheaton, Ill., and Yale R. Shea, Hales Corners, Wis., assignors to INRYCO, Inc., Milwaukee, Wis.

Filed Jun. 24, 1985, Ser. No. 747,953
Int. Cl.[4] E04B *5/48*; E04C *2/52*
U.S. Cl. 52—221 **9 Claims**



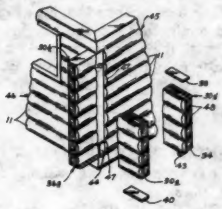
1. A floor structure comprising a poured-in-place slab of concrete, a plurality of cellular raceways extending generally parallel to each other and embedded in said concrete, a trench extending across the upper surfaces of said raceways and having points of intersection with said raceways, the upper side of said trench being substantially level with the upper surface of said concrete and the underside of said trench being embedded in said concrete and engaging the upper sides of said raceways, a plurality of preset service outlets embedded in said concrete and extending from said raceways to substantially the upper surface of said concrete, and a plurality of post-tensioned tendons embedded in said concrete and extending underneath said trench, and said trench extending substantially along a line of substantially zero bending moment of said concrete slab.

4,627,204

SIMULATED LOG END UNIT FOR BUILDINGS

Leedice S. Smith, Rte. 1, Box 155-A, Spokane, Wash. 99009

Filed Apr. 8, 1985, Ser. No. 720,998
Int. Cl.[4] E04B *1/10*
U.S. Cl. 52—233 **18 Claims**



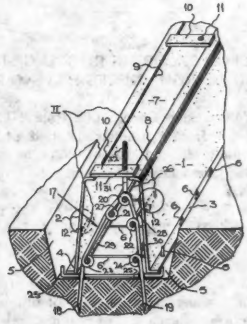
1. A simulated log end unit for buildings usage, comprising;
a back panel adapted to be rigidly attached to an upright building frame member, said back panel having oppositely facing side edges;
a pair of side panels constructed from preformed log siding and including opposed front and back edges, wherein the front edges of the side panels are mitered toward their respective back edges, the back edges of the side panels being rigidly attached to the side edges of the back panel at right angles thereto;
a planar front panel rigidly attached between and flush with the mitered front edges of the side panels;
and one or more sets of concentric rings visually presented on the exterior of said front panel, said rings simulating the end grain of wood logs.

4,627,205

BUILDING FOUNDATIONS INVENTION

William G. Hitchins, "Fiddawn", New Cascade Road, Norfolk Island 2899

Filed Jul. 23, 1985, Ser. No. 758,082
Claims priority, application Australia, Jul. 23, 1984, PG6164
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—294 **4 Claims**



1. In combination, a form for in-situ casting of concrete foundations, and a plurality of associated sacrificial adjuncts; comprising a pair of elongated side members disposable parallel to each other with their ends generally in register, said side members being so disposable as to extend upwardly and inwardly with respect to each other; horizontal flanges extending outwardly from bases of said side members and having therein a plurality of apertures through which bent-up ends of a corresponding plurality of width-control rods are receivable;

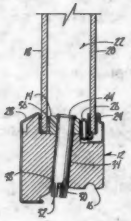
at least two web members connecting upper edges of said side members, each said web member being provided with an aperture therethrough; a plurality of reinforcement-positioning pins, each of inverted V-shape and each having limbs with ends being insertable into the ground; a plurality of reinforcing rods adapted to extend through loops in said reinforcement-positioning pins in parallel array; and a hook-bolt associated with each said web member and having a bight adapted as to fit around a said reinforcing rod and having a shank extendable upwardly through the aperture of the said web member, said shank being externally threaded so as to accept a co-operating nut.

4,627,206

WINDOW SASH BREATHER DEVICE

Timothy B. Cox, Knoxville, Iowa, assignor to Rollscreen Company, Pella, Iowa

Filed Sep. 12, 1985, Ser. No. 775,382
Int. Cl.[4] E06B 7/12
U.S. Cl. 52—302 **13 Claims**



8. A breather device for use in a vent hole comprising:
an elongated hollow sleeve member adapted to extend into said hole and having opposite interior and exterior ends; and
a plurality of resilient fingers extending axially from said exterior end of said member;
said fingers are provided with tip portions which are closely spaced so as to inhibit entry of foreign matter into said sleeve and being resilient so as to deflect radially outwardly when a cleaning tool is inserted through said device for removing any foreign matter therein.

4,627,207

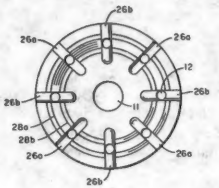
FASTENER FOR SECURING ROOFING MATERIAL TO CEMENTITIOUS ROOF DECKS HAVING REMOVABLE TAB

Kenneth E. Young, Snow Camp, N.C.; Robert T. Frohlich, Bedford; Hubert T. Dudley, Chelmsford, both of Mass., and Robert L. Hallock, Jr., Larchmont, N.Y., assignors to W. R. Grace & Co., Cambridge, Mass. and E.S. Products Co., New Rochelle, N.Y.

Division of Ser. No. 882,709, Mar. 2, 1978. This application Oct. 15, 1981, Ser. No. 311,697
Int. Cl.[4] F16B 15/02, 15/04
U.S. Cl. 52—361 **7 Claims**

1. A tab for a nail used to attach a base ply of a multi-ply built-up roofing membrane to a soft not fully cured cementitious construction material and over which ply fluid asphalt is to be applied after installation, said nail having a penetrating shank, said tab being generally planar and having broad upper and lower opposed planar surfaces, narrow terminal end surfaces and a means for holding said nail, said tab being wider in cross-wise dimension than said nail shank so that a portion of said tab extends beyond said nail shank, said tab having a plurality of openings therethrough distributed around its portion extending beyond said nail shank which openings extend from said upper planar surface to said lower planar surface, said tab further having at least one circumferential embossment raised from at least one of its said planar surfaces communicating with said openings and acting as an asphalt-conducting channel and at least one additional embossment extending from said opening to a said terminal edge acting as an asphalt-conducting channel between said opening and said edge, whereby fluid asphalt applied over said nail, tab and base ply is permitted to fill said openings and also to flow between said tab and said base ply in order to bond the portion of the base ply beneath said tab and increase the resistance of the roofing membrane to uplifting by wind.

5. The combination of roofing material for waterproofing a roof deck and a nail for securing said roofing material to the deck, comprising said roofing material including at least one base-ply layer of resilient sheet material engaging said deck and a layer of waterproof adhesive covering said resilient sheet material, said adhesive being flowable when it is applied and



substantially non-flowable after it sets, said nail including a tab portion comprised generally of a flat body having upper and lower surfaces and an outer edge, means for penetrating said resilient sheet material and attaching said nail to the deck with a substantial portion of said lower surface engaging said sheet material, said tab portion having as plurality of openings therethrough extending from its said upper surface to its said lower surface, said tab further having at least one circumferential embossment raised from at least one of its said surfaces communicating with said openings and acting an an adhesive-conducting channel and at least one additional embossment extending from a said opening to said outer edge to conduct said fluid adhesive between said opening and said edge, whereby fluid adhesive applied over said nail, tab portion and base ply fills said opening and also said embossments to bond the portion of the said base ply beneath said tab portion and increase the resistance of the roofing membrane to uplifting by wind.

4,627,208

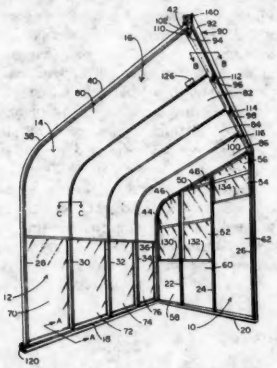
STRUCTURAL ELEMENT ESPECIALLY SUITABLE FOR SOLAR GREENHOUSES AND THE LIKE

Christopher Esposito, West Bay Shore, N.Y., assignor to Four Seasons Solar Products Corp., Farmingdale, N.Y.

Division of Ser. No. 455,475, Jan. 4, 1983. This application Mar. 5, 1985, Ser. No. 708,501
Int. Cl.[4] E04B 5/52
U.S. Cl. 52—483 **2 Claims**

1. A structural arrangement comprising an elongated hollow bar provided with a first longitudinally extending track channel having a relatively narrow longitudinally extending slot-type mouth, said bar being provided with a second track channel and mouth arranged in mirror image relationship to said first channel and the first said mouth and opening in opposite direction to the latter, the channels being substantially circular in cross-section and the mouths defining reentrant angles therewith, the bar being generally quadrilateral in shape and having four corners and including two pairs of parallel sides, said mouths being located in respective of the sides of one pair adjacent two of said corners, the sides of the other pair being provided with screw grooves, one of the sides of said other pair being provided with at least one channel adapted for receiving a sealing member, said structural arrangement fur-

ther comprising a sealing member in the latter said channel, a glazing member against the sealing member, a muntin against



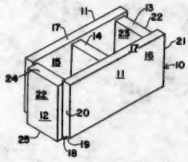
the glazing member, and a fastening means extending through the muntin into the corresponding screw groove.

4,627,209

INTERLOCKING BLOCKS AND CONSTRUCTION SYSTEM COMPRISING SAID BLOCKS

Ervin J. Schwartz, 70071 C.R.3, R.R. 3, Nappanee, Ind. 46550

Filed Apr. 15, 1985, Ser. No. 723,528
Int. Cl.[4] E04C 1/10
U.S. Cl. 52—589 5 Claims



1. A building block of integral monolithic construction comprising:

(a) two identical sidewalls of rectangular perimeter, each having (1) an interior surface, (2) a flat exterior surface, (3) a flat straight upper abutment edge surface which spans the distance between said interior and exterior surfaces, (4) a lower edge disposed below the corresponding upper abutment edge and parallel thereto in spanning relationship between said interior and exterior surfaces and having at least two steps, the first of said steps being a flat straight abutment surface contiguous to said interior surface, the second of said steps extending between said first step and said exterior surface, and positioned closer to said upper abutment edge than said first step, and (5) first and second vertical edge surfaces of flat straight configuration perpendicularly disposed between said interior and exterior surfaces, the corresponding several edge surfaces of the two sidewalls being in coplanar alignment, and

(b) first and second transverse walls located adjacent said first and second vertical edge surfaces, respectively, and disposed between the facing interior surfaces of said sidewalls in perpendicular spanning relationship therewith, each transverse wall being of substantially rectangular perimeter and bounded by a flat exterior abutment surface, an interior surface, and upper and lower edge surfaces perpendicularly disposed between interior and exterior surfaces of the transverse wall, the lower edge surfaces of said transverse walls being disposed below the lower edge surfaces of said sidewalls, the upper edge surfaces of said transverse walls being disposed below the upper edge surfaces of said sidewalls, the positioning of said first transverse wall being such that its exterior abutment surface is located forwardly of said first vertical edge surfaces, and the positioning of said second transverse wall being such that its exterior abutment surface is inwardly displaced from said second vertical edge surfaces in the direction of said first transverse wall, whereby

(c) the lower extremities of the transverse walls of the building block make snug interlocking contact with the interior surfaces of the sidewalls of an underlying building block of the same construction, and

(d) when placed end to end, the first transverse wall of a building block partially enters the interior space between the sidewalls of a horizontally adjacent building block, interlocking therewith and causing the flat exterior abutment surface of the first transverse wall of one building block to contact the flat exterior abutment surface of the second transverse wall of the next horizontally adjacent building block,

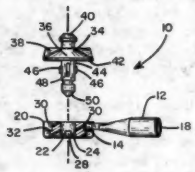
(e) said interactive abutment of the building block with identical underlying and horizontally adjacent building blocks causing formation of horizontal and vertical troughs, respectively.

4,627,210

HUB ASSEMBLY FOR COLLAPSIBLE STRUCTURE

Bryan J. Beaulieu, 1205 - 132nd St. West, Burnsville, Minn. 55337

Filed Oct. 28, 1985, Ser. No. 792,130
Int. Cl.[4] A45F 1/16
U.S. Cl. 52—646 10 Claims



1. A hub assembly for pivotally holding the ends of column-like support rods which make up the skeletal frames of collapsible, self-supporting structures, comprising

(a) a plurality of support rod ends, each support rod end comprising a spherical head joined to a neck having a narrowed portion adjacent the head and an enlarged portion adjacent a rod, said enlarged portion including a receptacle for receiving a rod;

(b) a circular hub body having a circumference arranged with a plurality of radially inward extending retaining sockets, each socket adapted for receiving and pivotally holding a head of one of said support rod ends, said hub body further having a central opening extending axially relative to said circumference;

(c) a circular locking disk having top and bottom faces, the bottom face having a centrally located bayonet adapted for reception into the central opening to align the bottom face of the disk in confronting relationship with the hub body to thereby retain the heads of the support rod ends within the sockets; and

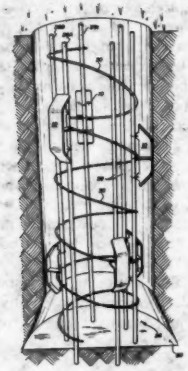
(d) releasable interlocking means for holding the bayonet within the central opening to thereby pivotally secure the support rod ends to form the hub assembly.

4,627,211

SLED FOR A REINFORCING CAGE USED IN A PIER

Thomas W. Foster, Jr., 3901 Shady Valley Dr., Arlington, Tex. 76013

Filed Sep. 23, 1985, Ser. No. 778,975
Int. Cl.[4] E04H *12/12*; E02D *5/22*
U.S. Cl. 52—652 12 Claims



1. A combination mobile support and static spacer adapted for positioning a reinforcing cage with respect to an earthen pier hole in both static and dynamic conditions, comprising:

(a) a runner having first and second ends and a substantially smooth plate therebetween, and the two ends being inclined in the same direction away from the plate so as to form a generally concave shape, and the plate having an area of at least 18 square inches for contacting the earth in the pier hole;

(b) a web extending longitudinally of the runner and affixed thereto so as to reinforce the runner and to hold the same in a generally concave shape;

(c) means associated with the web for bearing against a given one of the longitudinal reinforcing rods in a reinforcing cage; and

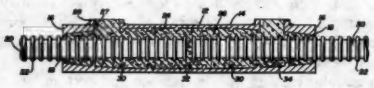
(d) means including a pair of wing elements which extend transversely of the web for positioning and orienting the web at a desired location alongside the reinforcing cage, and including means for permitting a tie-wiring connection of the wing elements to members of the reinforcing cage.

4,627,212

SPLICE SLEEVE FOR REINFORCING BARS WITH CYLINDRICAL SHELL

Alfred A. Yee, Honolulu, Hi., assignor to Hysao Miyamoto, Tokyo, Japan

Filed Aug. 9, 1985, Ser. No. 764,063
Int. Cl.[4] F16B *7/00*
U.S. Cl. 52—726 3 Claims



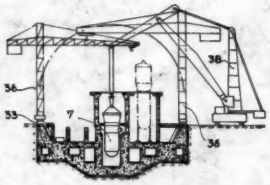
1. A splice sleeve for connecting reinforcing bars in reinforced concrete construction comprising an elongated shell of one-piece construction, said shell including substantially constant diameter internal and external cylindrical surfaces and end surfaces having an opening receiving the end portions of reinforcing bars to be connected, said internal surface of the shell including a plurality of longitudinally spaced, inwardly extending annular ridges spaced from the exterior of the reinforcing bars inserted into the shell, said internal surface and ridges constructed in a manner to provide a wedging action and radial inward compression for grouting material inserted into the annular space between the reinforcing bars and internal surface of the shell thereby locking the shell, grouting and reinforcing bars fixedly throughout their length whereby the external cylindrical configuration of the shell enables a splice sleeve to be utilized with a smaller external diameter for a given diameter of reinforcing bars thereby enabling the splice sleeve to be utilized in thinner concrete wall structures and columns of less cross-sectional area, said internal surface of the sleeve being cylindrical throughout its length, said means providing a wedge action including said ridges progressively increasing in their inward radial dimension from the innermost ridges toward the outermost ridges thereby providing a wedging action and compression of grouting introduced into the shell, the outermost end ridges on the internal surface defining end flanges with a central opening receiving the reinforcing bars.

4,627,213

METHOD OF CONSTRUCTING A NUCLEAR POWER STATION

Raymond Magnin, Nanterre, France, assignor to Framatome, Courbevoie, France

Division of Ser. No. 194,131, Oct. 6, 1980, Pat. No. 4,416,849.
This application Jun. 22, 1983, Ser. No. 506,920
Claims priority, application France, Nov. 14, 1979, 79 28067
Int. Cl.[4] G21C *13/00*
U.S. Cl. 52—745 3 Claims



1. Method of constructing on a single one-piece foundation a nuclear power station comprising a reactor building (1) containing a reactor core and a primary cooling circuit between said core and at least one steam generator, a fuel building (2) for processed new and used fuel, an ancillary building (3) for nuclear, electrical and safety equipment and an engine building (6) for turbogenerator units, said buildings being arranged in the general shape of a T, said fuel building (2) and ancillary building (3) being arranged in line and adjacent either side of said reactor building (1) which is perpendicular to the said engine building, and pre-fabricated vaulted enclosures having identical profiles for each of said buildings (1, 2, 3) and rigidly connected with said foundation, said vaults having a generally cylindrical shape with horizontal generatrices parallel to the longitudinal axes of said buildings (1, 2, 3), said method comprising the steps of

(a) constructing a single one-piece foundation for supporting all of said reactor, fuel and ancillary buildings (1, 2, 3);

(b) laying service tracks (33) parallel to and on both sides of said foundation;

(c) positioning lifting and transport means (36, 38) on said service tracks;

(d) constructing concrete inner structures of said buildings (1, 2, 3) of pre-fabricated units brought and positioned by said lifting and transport means;

(e) placing large pieces of said nuclear, electrical and safety equipment in place in said ancillary building while concurrently constructing and positioning supports for said equipment with the aid of said lifting and transport means;

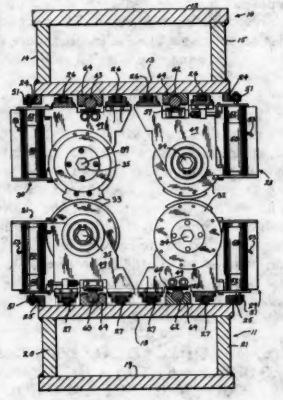
(f) positioning said vaulted enclosures on said foundation (28) with the aid of said lifting and transport means; and
(g) assembling said vaulted enclosures to form one continuous vaulted enclosure for said buildings.

4,627,214

SLITTING-SCORING MACHINE

Leland J. Anderson, Catawba; James K. Jourdan, and Carl R. Marschke, both of Phillips, all of Wis., assignors to Marquip, Inc., Phillips, Wis.

Filed Sep. 23, 1985, Ser. No. 779,153
Int. Cl.[4] B26D 9/00
U.S. Cl. 83—71 16 Claims



1. A machine for slitting and scoring a web of longitudinally traveling cardboard or the like along the upstream-to-downstream direction of web travel, comprising, in combination:
(a) a frame (4,5),
(b) an upper and a lower heavy box beam (10, 11) connected to said frame and adapted to extend transversely across a web (2) with the web disposed between said beams,
(c) longitudinally spaced transversely extending rotatable shafts (34, 35) connected to each said upper and lower box beam (10, 11) and forming pairs of upstream and downstream shafts,
(d) a plurality of generally opposed web scoring blades (32) mounted on one of said pairs of shafts for rotation therewith,
(e) a plurality of generally opposed web slitting blades (33) mounted on the other of said pairs of shafts for rotation therewith,
(f) scoring and slitting assemblies (28–31) associated with each said respective blade (32, 33),
(g) and means (26, 27) mounting said assemblies to said upper and lower box beams.

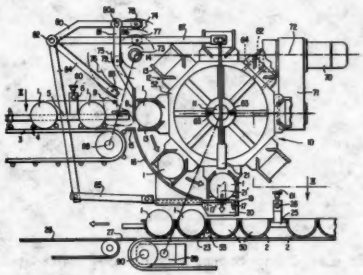
4,627,215

APPARATUS FOR CHARGING RECEPTACLES WITH STACKED, FLAT ITEMS

Theo Walz, Neunkirch, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed May 9, 1985, Ser. No. 732,274
Claims priority, application Switzerland, May 9, 1984, 2272/84
Int. Cl.[4] B65B 5/06
U.S. Cl. 53—246 10 Claims

1. In an apparatus for charging receptacles with groups of stacked, flat, wafer-shaped articles, including a first conveyor means for advancing article groups thereon towards a discharge end thereof; a second conveyor means, situated below said first conveyor means, for advancing receptacles to a filling position and third conveyor means for receiving the article groups from the discharge end of the first conveyor means and advancing the article groups to a container dwelling in said filling position on said second conveyor means, the improvement comprising pusher means for sequentially pushing article groups from the discharge end of said first conveyor means into said third conveyor means and wherein said third conveyor means comprises a plurality of positioning devices, each having article group holding means, travelling sequentially and intermittently from adjacent said discharge end of said first conveyor means downwardly to a location immediately above said filling position, and means for introducing the article groups from a respective said positioning device in said location thereof into a respective said container in said filling position thereof; said means for introducing the article groups including a bottom gate situated in said filling position and having a first position in which it is situated such as to prevent article groups from passing from said location into said container in said filling position thereof and a second position in which it is situated such as to allow article groups to pass from said location into said container in said filling position; guide plate means situated in said location between the positioning device dwelling in said location and said container dwelling in said filling position for guiding each article group in said location from the positioning device into the container; and ejector means positioned in alignment with said location and said filling position for pushing the article group from the positioning device dwelling in said location toward said container dwelling in said filling position.



4,627,216

APPARATUS FOR THE POSITIVE TRANSFER OF TUBES FROM THE LINE WHICH PROCESSES THEM INTO BOXES OF TUBE-FILLING AND BOXING MACHINES

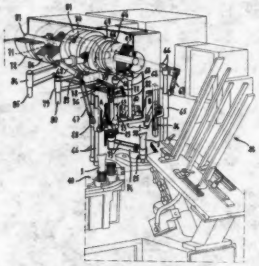
Ivo Argazzi, Pianoro Nuova, Italy, assignor to I.M.A.—Industria Macchine Automatiche—S.p.A., Ozzano Emilia, Italy

Filed Jun. 27, 1985, Ser. No. 749,876
Claims priority, application Italy, Aug. 3, 1984, 3555 A/84
Int. Cl.[4] B65B 5/04, 7/14
U.S. Cl. 53—251 1 Claim

1. An apparatus for the positive supply of preformed crushable tubes which are filled with their bases open from a processing line to boxes in a tube-filling and boxing machine, the said processing line comprising a plurality of uniformly spaced resilient take-up members and the boxes being supplied made up with their filling apertures upwardly open from tubular blanks which are folded flat with their respective panels superimposed in mutual contact and taken rhythmically from the base of an inclined store containing them in a stacked said arrangement, said apparatus comprising first gripper means which can be moved vertically with an alternating movement for the rhythmic take-up of the tubes from the said processing

line, second gripper means movable vertically in alternating manner for the rhythmic insertion of these tubes into boxes made up with their filling apertures upwardly open, and further gripper means moving horizontally for the rhythmic transfer of the tubes from the first to the second gripper means,

said first gripper means comprising two jaws supported and coupled such that said jaws can be moved in counter-rotation, a first system of articulated levers with an end of one of the levers pivoted rigidly on the axis of rotation of one of said jaws and an end of the other of said levers held slidably in a vertical guide element asociated with a lever of a second articulated lever system controlled by control means;



said second gripper means comprising a fixed jaw and a movable jaw, the movable jaw of said second gripper means having an arm held slidably by a free end thereof in a vertical guide element associated with a corresponding articulated lever system controlled by respective control means; and

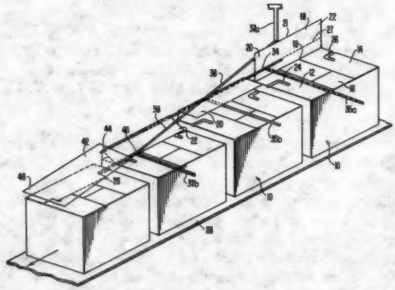
said further gripper means being formed by arms shaped at their respective free ends as semicircular jaws arranged in mirror image and provided with control means for the actuation of the arms of said further gripper means and therefore of the jaws thereof, said control means of said first, second and further gripper means being coordinated for the takeup and insertion of said tubes.

4,627,217

APPARATUS FOR AUTOMATICALLY CLOSING L-SLIDE LOCK CASES

John Plaskett, Dallas, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Aug. 20, 1985, Ser. No. 767,595
Int. Cl.[4] B65B *7/24*
U.S. Cl. 53—374 **16 Claims**



1. Apparatus for automatically closing the top of a case having a closing flap and L-slide lock slots for receiving opposite free end corners of the closing flap while the case is moving with its longitudinal axis in the direction of movement, the apparatus comprising:

(a) a conveyor for moving a case, the case having a top portion which includes an open closing flap having a free longitudinal edge and opposite free end corners, the top portion further including L-slide lock slots for receiving respective free end corners of the closing flap;

(b) means for guiding the case to accurately position the case on the conveyor during movement of the conveyor with the longitudinal axis of the case in the direction of movement of the case;

(c) means for bending the closing flap to form a longitudinal bend in the closing flap while the case is moving on the conveyor so that the free longitudinal edge of the closing flap is positioned at about a level with the top of the case and the opposite free corners of the closing flap are positioned adjacent respective L-slide lock slots, the longitudinal bend being generally parallel with the direction of movement of the case;

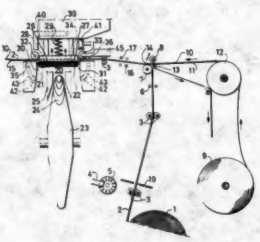
(d) means for tucking the opposite free end corners of the closing flap into the respective L-shaped slots during movement of the case by the conveyor, the closing flap tucking means including means for holding the longitudinal edge of the closing flap at about a level with the top of the case, the closing flap tucking means further including means for guiding the longitudinal bend of the closing flap to a position at about a level with the top of the case, while the case is moving on the conveyor, to cause each of said free end corners to enter the respective L-shaped slots and thereby close the top of the case.

4,627,218

METHOD OF AUTOMATICALLY BANDEROLING BUNDLED SHEET OBJECTS AND APPARATUS FOR CARRYING OUT THE METHOD

Bengt Akerström, Lidingö , and Friedrich Hartmann, Saltsjöbaden, both of Sweden, assignors to Esselte Security Systems, Stockholm, Sweden

Continuation of Ser. No. 569,153, Jan. 9, 1984, abandoned. This application Jul. 9, 1985, Ser. No. 753,810
Int. Cl.[4] B65B *51/06*
U.S. Cl. 53—399 **13 Claims**



1. A method of automatically banderoling sheet objects, such as banknotes, arranged in a bundle, by laying a banderole strip, such as a paper strip, about the bundle, and thereafter sealing the bundle by joining together the end portions of the strip, comprising: advancing a desired length of said strip with one strip end leading in the direction of movement toward a receiving position at the base of a structure by which a plurality of sheet objects are assembled and placed as a bundle with the face of the first one sheet object against the mid-portion of the strip with end portions of the strip extending from both sides of the bundle location; separating said desired length of strip from a supply means to form a strip trailing end; attaching one portion of a small self-adhesive label to and extending forwardly from the leading end of said strip, so that the second portion of the label projects forward from said leading strip

end portion, prior to its being advanced to said receiving position; continuing to feed said separated desired length of strip, with the attached label on the strip leading end, in said direction into said receiving position, said leading end of said separated strip being an overlying end portion in a strip folding operation, the other, trailing, end portion of said separated strip being an underlying end portion in said strip folding operation; said strip folding operation comprising engaging and folding the end portions of said strip past and against the opposed side ends of the bundle of sheet objects at said receiving position; then further folding the strip trailing end portion, which will become the underlying end portion, over and flat against the face of the final sheet object in the bundle; folding the strip leading end portion, which will become the overlying end portion, the end with the label attached, over and flat against the same face of the final sheet object so that the two ends of the strip are juxtaposed and the projected portion of the label overlaps the underlying trailing end portion of said strip; and pressing the projected second portion of the label into adhered condition to said underlying trailing end portion of the strip, thereby sealing the strip around the bundle of sheet objects.

4,627,219
METHOD FOR BUNDLING PAPER SHEETS OR THE LIKE

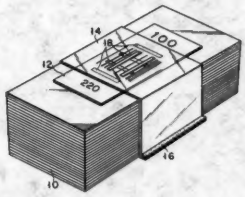
Shozo Omori, Tokyo, Japan, assignor to Omori Machinery Co., Ltd., Kawasaki and Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, both of, Japan

Continuation of Ser. No. 370,819, Apr. 22, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,214

Claims priority, application Japan, Sep. 24, 1981, 56-141710[U]; Nov. 16, 1981, 56-169383[U]

Int. Cl.[4] B65B *11/02, 61/20*

U.S. Cl. 53—399 **11 Claims**



1. A method for bundling sheets of paper or the like comprising:

a first step of stacking the sheets of paper;

a second step of positioning a nonadhesive first side of a label adjacent to and in contact with an uppermost sheet in the stack, said label also having a printable side, opposite to said first side upon which bundle identifying information is printed;

a third step including (a) winding, one direction, the stacked sheets of paper with a transparent tape made of a heat-activated adhesive material such that the tape extends across the printable side of the label in said one direction so that at least one portion of the tape is in registry with the printable side thereof, whereby the bundle identifying information is visually perceivable through the wound tape and (b) superposing both end portions of the tape with each other such that both end portions of the tape are contact with each other;

a fourth step of heating the superposed end portions of the wound tape to heat adhere both end portions to each other without heat adhering the transparent tape to the sheets in the bundle to firmly hold the stacked sheets of paper; and

a fifth step of heating only the one portion of the tape in registry with the label so that the label is heat-adhered only to the tape and not to the uppermost sheet in the stack by virtue of heat-adherance between the printable side and the registered portion of the tape and by virtue of the nonadhesive first side of the label being in contact with the uppermost sheet in the stack.

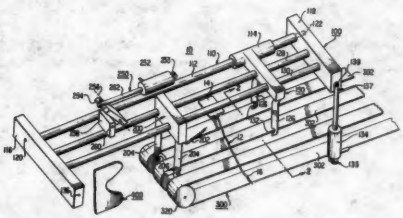
4,627,220
CONVEYING AND GROUPING OF STRINGED TAGS

Steve J. Lynch, Milford, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 685,925, Dec. 24, 1984. This application Aug. 30, 1985, Ser. No. 770,904

Int. Cl.[4] B65B *27/10*

U.S. Cl. 53—414 **5 Claims**



5. Method of grouping stringed tags, comprising the steps of:

(a) collecting the stringed tags on a conveyor;

(b) conveying the stringed tags at a first speed until a designated number of tags have been collected;

(c) conveying the stringed tags at a second speed to separate the designated number of stringed tags from incoming stringed tags;

(d) lowering a forward rake behind the collected stringed tags;

(e) moving the forward rake to gather the stringed tags until same are held between the forward rake and an accumulating rake;

(f) moving the rakes with the held tags into a tying apparatus to tie the tags;

(g) withdrawing the tied stringed tags from the tying apparatus;

(h) moving the rearward rake away from the forward rake, whereby the tied stringed tags are released.

4,627,221
METHOD FOR PRODUCING STERILE PACKAGES

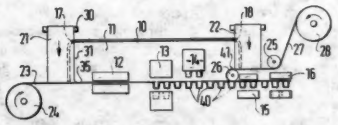
Norbert Buchner, Winnenden, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 15, 1985, Ser. No. 765,992

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1984, 3439020

Int. Cl.[4] B65B *55/02*

U.S. Cl. 53—425 **6 Claims**



1. A method for producing packages containing a sterile product in seriatim in a sterile atmosphere comprising the steps of:

introducing a first deformable packaging material in the form of a tubular homogeneous strip into said atmosphere, said tubular strip having a sterile inner face portion,

opening said tubular strip by severing longitudinally and exposing said inner face portion in said atmosphere,

forming depressions in the opened strip whereby the inside of said depressions is constituted by said sterile inner face portion,

filling said depressions with a sterile product,

introducing a second packaging material in the form of a homogeneous tubular strip having a sterile inner face portion into said atmosphere,

opening said second tubular strip by severing longitudinally and exposing said inner face portion in said atmosphere, causing said second strip to form a running length of strip material with a sterile face portion,

bringing in contact the sterile face portion of said second strip with the inner face portion surrounding the filled depressions of said first strip, and

sealing said contacted surfaces together to form sealed packages having a sterile interior and severing the packages.

4,627,222

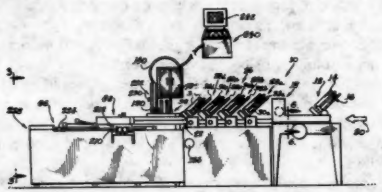
SYSTEM FOR IN-LINE PROCESSING OF ENVELOPES AND THE LIKE

Jack W. Cantile, Richmond, Va., assignor to Hammermill Paper Company, Erie, Pa.

Filed Jun. 10, 1982, Ser. No. 387,106

Int. Cl.[4] B65B *35/30*

U.S. Cl. 53—443 **36 Claims**



1. A system for processing envelopes and the like comprising:

conveyor means adapted to receive and convey envelopes in a continuous stream along a predetermined path;

first feed means, adapted to support a plurality of primary envelopes in a generally upstanding stack, for sequentially feeding said primary envelopes in a continuous stream onto said conveyor means and for interrupting said continuous stream to leave selcted spaces in said stream in response oto first predetermined command signals;

first printer means, cooperative with said conveyor means, for printing indicia on envelopes fed onto said conveyor means by said first feed means in response to first print command signals;

at least one inserter means, adapted to support a plurlaity of insert envelopes in a generally upstanding stack and cooperative with said conveyor means, for feeding said insert envelopes onto said conveyor means in said selected spaces in response to predetermined inserter command signals;

second printer means, cooperative with said conveyor means and operative in response to predetermined second print command signal, for printing individualized indicia on each successive primary and insert envelope passed along said predetermined path by said conveyor means; and

control means operatively associated with said conveyor means, first feed means, inserter means and first and second printer means, said control means being adapted to provide said first predetermined command signals, said inserter command signals and said first and second print command signals in a predetermined sequence so as to automatically establish predetermined spacing between successive primary envelopes fed onto said conveyor means, cause successive primary envelopes to be printed by said first printer means, cause insert envelopes to be inserted into said selected spaces between said primary envelopes created for this purpose, and effect printing of individualized indicia on each success ive envelope by said second printer means.

31. A continuous envelope processing method for church offering envelope sets wherein each set comprises a plurality of primary envelopes and at least one special insert envelope in a predetermined sequence and wherein each of the envelopes of a set has alphanumeric indicia printed on at least one print line parallel with the major longitudinal axis of the envelopes; said method comprising the steps of:

feeding primary envelopes in a continuous stream from a first supply of envelopes onto a conveyor means such that the movement of the primary envelopes is parallel to said print line;

interrupting said continuous stream of primary envelopes at timed intervals such that a selected space is left in the continuous flow of envelopes;

inserting in the said selected space said at least one spacial insert envelope from a second supply of envelopes; and

serially printing the alphanumeric indicia on each envelope as it moves along said conveyor means.

4,627,223

PACKAGE BLANK AND PACKAGING METHOD

Veikko I. Janhonen, Långvik, 02420 Jorvas, Finland

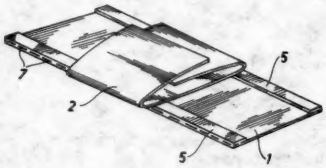
PCT No. PCT/FI83/00006, § 371 Date Sep. 26, 1983, § 102(e) Date Sep. 26, 1983, PCT Pub. No. WO83/02764, PCT Pub. Date Aug. 18, 1983

PCT Filed Jan. 26, 1983, Ser. No. 541,328

Claims priority, application Finland, May 5, 1982, 821571; Feb. 5, 1983, 820384

Int. Cl.[4] B65B *11/58*

U.S. Cl. 53—449 **4 Claims**



1. A package blank comprising:

a flat, elongated, rectangular outer cardboard sheet free of laterally extending creases and fold lines, the longer edge portions of said outer sheet being folded back upon and bonded to an inner face of said outer sheet to reinforce the longer edges, said edge portions being of uniform width throughout their length; and

an elongated, rectangular inner sheet of a flexible material free of laterally extending creases and fold lines, said outer sheet being of a material substantially stiffer than the material of said inner sheet, the length of said inner sheet being at least approximately double the width between the folded edges of said outer sheet, said inner sheet having a width less than half the length of said outer sheet; said inner sheet and said outer sheet being arranged perpendicularly to each other and adhesively secured together, whereby an article shorter than said width of said outer sheet can be wrapped and covered by said inner sheet and recessed between said folded edges of said outer sheet so that said edge portions protect the article and absorb impact.

4,627,224
METHOD AND AN APPARATUS FOR PACKING A SEMISOLID COMPOUND IN BAGS

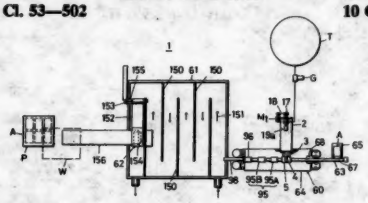
Hideki Hamamoto, Himeji; Tsutomu Fujita, Suita, and Takuzo Mori, Takatsuki, all of Japan, assignors to Nihon Spindle Seizo Kabushiki Kaisha and Showa Rekisei Kogyo Kabushiki Kaisha, both of Hyogo, Japan

Filed Jul. 6, 1984, Ser. No. 628,630

Claims priority, application Japan, Mar. 30, 1984, 59-64680

Int. Cl.[4] B65B *3/28*

U.S. Cl. 53—502 **10 Claims**



1. An apparatus for continuous packing semisolid compound into a bag, comprising:

a bag supplying means for removing synthetic resin bags from a stack of said bags, having an opened end, said bag supplying means including a bag removal device which is caused to remove said bags one-by-one and deliver them with their opened ends upward to transporting means;

said transporting means being for intermittently moving said bags to a position in which said bags are filled with a semisolid compound;

a precooling device for cooling down a molten high temperature semisolid compound to a desired temperature;

a weighing and delivering device for receiving semisolid compound from said precooling device and delivering a predetermined quantity of said semisolid compound to a filling valve;

said filling valve being caused to inject said predetermined quantity of said semisolid compound into said bags one-by-one as said bags are moved by said transporting means;

said supporting means including a pair of endless belts forming a space therebetween for supporting the sides of said bags and a lower supporting means positioned below and between said endless belts for supporting the bottom of said bags;

cooling means positioned along the path of said transporting means for cooling said bags while they are being moved by said transporting means;

heat sealing means positioned along the path of said transporting means for heat sealing said opened end of said bags while they are being moved by said transporting means;

a cooling water tank positioned at one end of said transporting means for cooling said bags after said bags are sealed; and

a bag removal means for removing said filled and sealed bags from said water tank and for transporting said bags away from said water tank.

4,627,225
LOADING APPARATUS FOR A PACKAGING MACHINE FOR SMALL PRODUCTS

Peter Faller, Biberach; Herbert Rittinger, and Detlev Gertitschke, both of Laupheim, all of Fed. Rep. of Germany, assignors to Josef Uhlmann Maschinenfabrik GmbH & Co. KG, Laupheim/Wurtt., Fed. Rep. of Germany

Filed May 1, 1985, Ser. No. 729,440

Claims priority, application Fed. Rep. of Germany, May 2, 1984, 3416200; Sep. 12, 1984, 3433371

Int. Cl.[4] B65B *55/24*

U.S. Cl. 53—510 **12 Claims**

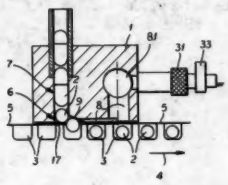
1. A loading apparatus for a packaging machine for small products comprising:

a filling shoe for input of said products into one of a plurality of receptacles of a package component moving past and under said filling shoe;

means to move said receptacles in a given direction past said filling shoe;

at least one feed chamber formed in said filling shoe and having a mouth open toward said package component and a receptacle of said package component aligned with said chamber to receive a product therefrom;

a product duct communicating with said feed chamber for feeding said products in series one after another to said feed chamber;



at least one vacuum passage formed in said shoe and connected with a vacuum source for evacuating a flow of air, said passage opening into said chamber at a location other than that at which said duct is connected thereto and adjacent said mouth and being formed as a groove in said given direction in said shoe opening directly toward said component and into said receptacle aligned with said chamber to remove dust and facilitate the transport of said products into said receptacles.

4,627,226
CROP GATHERING ATTACHMENT FOR CROP HARVESTING MACHINE

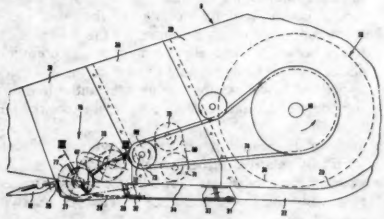
Frans J. G. C. De Coene, Zedelgem, Belgium, assignor to New Holland Inc., New Holland, Pa.

Filed Jan. 23, 1985, Ser. No. 694,197

Claims priority, application United Kingdom, Feb. 4, 1984, 8403017

Int. Cl.[4] A01D *41/06*

U.S. Cl. 56—14.6 **7 Claims**



1. A crop gathering attachment for a crop harvesting machine having crop receiving means capable to receive crop from the ground, first crop feeder means, and second crop feeder means disposed between the crop-receiving means and the first feeder means, an improved said second feeder means comprising:

a plurality of longitudinally spaced rotatable members mounted for rotation about a transverse axis, each said rotatble member having retractable crop conveying means operable to retract and extend relative to said rotatable member upon rotation thereof;

drive means for rotating said rotatable members so that the respective said retractable crop conveying means operatively cooperate with adjacent crop conveying means to convey crop rearwardly from one rotatable member to

the other until said crop is delivered to said first feeder means; and

a transversely extending removable section disposed between said first and second feeder means to permit a changing of the longitudinal distance between said first and second feeder means.

4,627,227

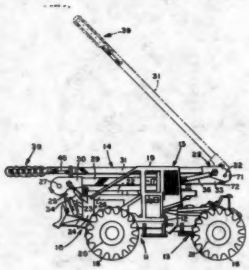
RIGHT-OF-WAY TREE LINE TRIMMER

Raymond E. Dixon, Box 59, Broaddus, Tex. 75929

Continuation of Ser. No. 435,718, Oct. 21, 1982, abandoned. This application Mar. 25, 1985, Ser. No. 715,706

Int. Cl.[4] A01D *55/18*

U.S. Cl. 56—235 11 Claims



1. A right-of-way tree line trimmer comprising a vehicle having an operator's station, a boom assembly having multiple articulated parts located in a generally vertically extending principal cutting plane laterally offset from and generally parallel to a longitudinal axis of the vehicle, said articulated parts comprising pivot means mounted on said base member forming a first horizontal axis;

a lower boom, said pivot means supporting one end of said lower boom for pivotal movement relative to said first axis in said common plane; and

an upper boom pivotally mounted to the other end of said lower boom pivotally mounted to the other end of said lower boom for vertical movement in said common plane about a second axis parallel to said first axis, each of said upper and lower booms having substantial length so that the combined length thereof is at least twice the length of the vehicle;

a first power means for pivotally moving the lower boom vertically relative to the base member,

a second power means for pivotally moving the upper boom relative to the lower boom for at least 90° relative to the lower boom,

an elongated cutter head, said cutter head including a plurality of circular saw blades, each saw blade mounted on a rotatable shaft which are mounted parallel to each other and in the same plane, said saw blades positioned in radially overlapping but axially offset relationship, and means for driving said saw blades,

means for mounting one end of said cutter head to the outer end of said upper boom in longitudinal alignment with the upper boom,

means to control the flow of fluid to said first and second power means to raise and lower said upper and lower booms either simultaneously or independently so that the cutter head may be moved in successive arcuate vertical swaths in said common plane to thereby cut tree limbs extending across the vertical plane in which the cutter head is operating.

4,627,228

METHOD OF AND APPARATUS FOR STARTING UP INDIVIDUAL WORKING ELEMENTS OF A TEXTILE MACHINE, E.G. A SPINNING MACHINE

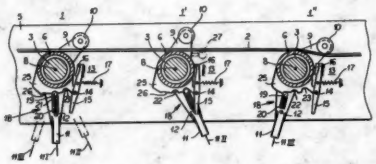
Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Apr. 10, 1985, Ser. No. 721,596

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413764

Int. Cl.[4] D01H *13/00;* F16H *7/12*

U.S. Cl. 57—88 18 Claims



1. A method of starting up individual working elements of a textile machine in which a multiplicity of working elements each have a whorl in tangential contact with a common belt, comprising, while a number of said elements are driven by tangential contact at a normal operating pressing force of their respective whorls with said belt at a given operating speed, the steps of:

individually starting up one of said elements from standstill over an acceleration interval to said operating speed by applying said belt to said whorl of said element at standstill with a substantially greater friction force than that between said belt and the whorls of said elements at said operating speed;

by applying said belt with increased pressing force against the whorl of the accelerated element;

maintaining a greater friction force between said belt and the whorl of the element thus accelerated from standstill over at least a major portion of said acceleration interval by the application of increased pressing force of the belt against the whorl of the accelerated element; and

decreasing the pressing force applied by said belt to the accelerated whorl to said normal operating pressing force when the latter whorl reaches said given operating speed.

4,627,229

COMPACT STEEL CORD FOR IMPROVED TENSILE STRENGTH

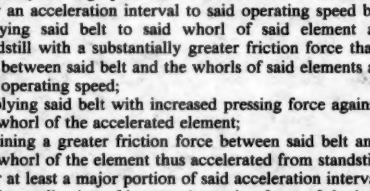
Luc Bourgois, Waregem-Desselgem, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Jun. 26, 1985, Ser. No. 748,988

Claims priority, application United Kingdom, Jul. 9, 1984, 8417485; Oct. 22, 1984, 8426654

Int. Cl.[4] D02G *3/48;* D07B *1/06*

U.S. Cl. 57—213 20 Claims



1. A rubber adherable steel cord adapted for reinforcement of resilient articles, comprising:

(a) a core of wires, each wire having a predetermined diameter, twisted together with a predetermined twist pitch,

(b) a surrounding layer of wires, each wire having a predetermined diameter, twisted with a predetermined pitch in

the same sense as the core,

(c) the twist pitch of the core being substantially different from the twist pitch of the surrounding layer, and

(d) the diameter of the core wires being substantially larger than the diameter of the wires of the surrounding layer.

4,627,230

OPEN-END FRICTION SPINNING MACHINE

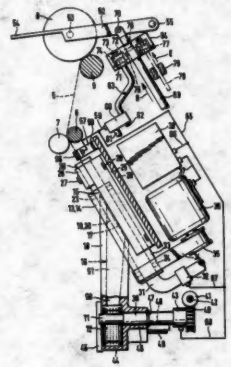
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Uberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 731,263

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416886

Int. Cl.[4] D01H *15/00, 13/16*

U.S. Cl. 57—401 **26 Claims**



1. An open-end friction spinning apparatus having a plurality of spinning units, each said unit containing friction surface means forming a yarn formation zone for the formation of yarn, friction driving means for driving said friction surface means in said yarn formation zone, wind-up spool means for winding up formed yarn, spool driving means for driving said wind-up spool means and yarn guard means for sensing yarn breakage in said spinning unit, comprising:

automatic friction drive disengaging means at each said unit for disengaging said friction drive means from said friction surface means, and

automatic spool drive disengaging means at each said unit for disengaging said spool driving means from said wind-up spool means,

said automatic friction drive disengaging means and said automatic spool drive disengaging means being responsive to said yarn breakage sensed by said yarn guard means.

4,627,231

MESH BAND

Manabu Kiuchi, 2-12-21, Shinjyuku, Zushi-Shi, Kanagawa-Ken, Japan

Filed Nov. 7, 1984, Ser. No. 669,190

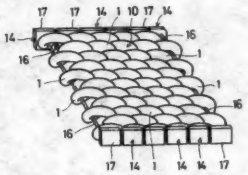
Claims priority, application Japan, Mar. 1, 1984, 59-039283

Int. Cl.[4] F16G *13/00*

U.S. Cl. 59—80 **16 Claims**

1. A mesh band comprising a plurality of juxtaposed helical members, each of said helical members having a first end and a second end, said plurality of juxtaposed helical members being disposed such that said first ends define an end face extending longitudinally of the mesh band and said second ends define a second end face extending longitudinally of the mesh band such that said first end face is spaced from said second end face by the length of said helical members, a plurality of first pin members each having a first head and at least one first elongated pin body integrally formed with said first head, said first pin bodies having a longitudinal length not exceeding one half the length of said helical members, said first pin members being disposed along said first end face such that said first pin bodies extend partially into said helical members from said first end face and said first heads are disposed along said first end face to cover said first ends of said helical members,

a plurality of second pin members each having a second head and at least one second elongated pin body integrally formed with said second head, said second pin bodies having a longitudinal length not exceeding one half the length of said helical members, said second pin members being disposed along said second end face such that said second pin bodies extend partially into said helical members from said second end face and said second heads are disposed along said second end face to cover said second ends of said helical members, said helical members being rigidly fixed to said first and second pin bodies for connecting said helical members together by means of said first and second pin members to form a unitary mesh band, said first and second heads protectively covering said first and second ends of said helical members respectively so that the mesh band can be safely worn by a user without exposure to said first and second ends of said helical members.



4,627,232

LINK CHAIN

Peter Bruce, Onchan, Isle of Man, assignor to Brupat Limited, Onchan, United Kingdom

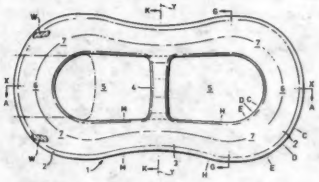
PCT No. PCT/GB84/00154, § 371 Date Jan. 3, 1985, § 102(e) Date Jan. 3, 1985, PCT Pub. No. WO84/04370, PCT Pub. Date Nov. 8, 1984

PCT Filed May 8, 1984, Ser. No. 690,492

Claims priority, application United Kingdom, May 5, 1983, 8312251

Int. Cl.[4] F16G *13/06*

U.S. Cl. 59—84 **13 Claims**



1. A chain comprising a series of interconnected links, each link comprising a pair of opposed C-shaped ends joined by joining limb portions when viewed at right angles to a longitudinal plane of symmetry bisecting said C-shaped ends and said joining limb portions, said longitudinal bisecting plane defining the plane of the link, each C-shaped end including a central crown portion and shoulders located on each side of said central crown portion, the section modulus about an axis perpendicular to said plane of the link of a cross-section of each shoulder being greater than the corresponding section modulus of a cross-section of the corresponding central crown portion.

4,627,233

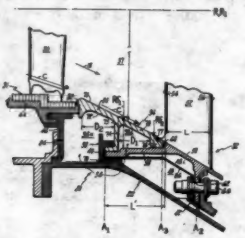
STATOR ASSEMBLY FOR BOUNDING THE WORKING MEDIUM FLOW PATH OF A GAS TURBINE ENGINE

Walter J. Baran, Jr., South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 518,908, Aug. 1, 1983. This application Apr. 19, 1985, Ser. No. 725,175

Int. Cl.[4] F02C *1/06;* F01D *5/14;* F03B *7/00*

U.S. Cl. 60—39.161 4 Claims



1. An arcuate duct segment for an axial flow gas turbine engine, the engine having a high pressure turbine, a low pressure turbine and a transition region extending between the turbines, the segment having an axis of radius R_1, a convex side and a concave side disposed about the axis, the concave side adapting the duct segment to bound the transition region, which comprises:

a first foot which extends circumferentially about the convex side of the segment, which is radially oriented with respect to the axis R_1, and which has a radial length R_{f1} from the concave side;

a second foot which extends circumferentially about the convex side of the segment, which is radially oriented with respect to the axis R_1, which has a radial length R_{f2} from the concave side and which is spaced axially from the first foot by a first distance D_1;

a transition piece having said concave side which is angled with respect to the axis of the segment, which has a span extending between the first foot and the second foot for joining the first foot to the second foot and which has an extension projecting from the first foot in cantilevered fashion and extending a second distance D_2 from the first foot;

wherein the distance D_2 is equal to or greater than the first distance D_1 and wherein the radial length R_{f1} of the first foot is greater than one and one half times the radial length R_{f2} of the second foot such that a change in the length of the first foot facilitates accommodating a change in the angle of the concave side with respect to the axis of the segment during a redesign of the turbine which causes the diameter of the flow path of the high pressure turbine to change with respect to the flow path of the low pressure turbine.

4,627,234

GAS TURBINE ENGINE/LOAD COMPRESSOR POWER PLANTS

Paul A. Schuh, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 15, 1983, Ser. No. 504,441

Int. Cl.[4] F02C *7/26, 9/28*

U.S. Cl. 60—39.281 6 Claims

1. A single shaft gas turbine engine power plant comprising:

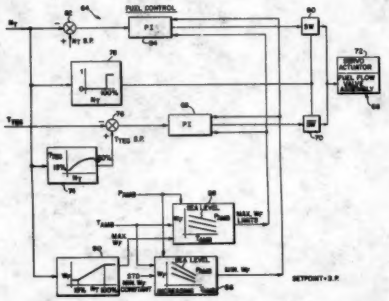
a power head and a radial load compressor driven by said power head, said power head being an air breathing gas turbine engine comprising a radial compressor;

a combustor for heating, and thereby adding energy to, the air discharged from said radial compressor; and

a radial gas turbine driven by hot gases flowing thereto from said combustor, said radial gas turbine being drive connected to the engine and load compressor; and

said power plant further comprising means for so scheduling a flow of fuel to said turbine engine combustor as to be simultaneously responsive to a radial gas turbine exhaust temperature and to gas turbine engine speed to thereby maintain the turbine exhaust temperature below selected maximums during start-up and acceleration of said gas turbine engine to a specified speed and to thereafter keep the gas turbine engine speed from exceeding a selected maximum;

said fuel flow scheduling means including means which is effective when the engine reaches a selected speed to switch the functioning of the scheduling means from a turbine exhaust gas temperature input mode of operation to an engine speed input mode of operation and a modulating type fuel flow control valve controllingly coupled to the means for switching the functioning of the fuel flow scheduling means;



said means for switching the functioning of the fuel flow scheduling means including a first gating means for transmitting a first, exhaust gas temperature responsive signal to an actuator of said fuel flow control valve, a second gating means for transmitting a second, turbine speed responsive signal to said actuator, and means operable when the engine reaches said selected speed to inactivate the first and activate the second of said gating means; and

said means for so scheduling the flow of fuel to said turbine engine combustor as to maintain the turbine exhaust gas temperature below said selected maximums comprising means for summing and providing a flow correction signal from a first signal indicative of measured turbine exhaust gas temperature and a second signal indicative of an exhaust gas set point temperature and means for establishing corrected minimum and maximum limits of the flow correction signal for the actuator of said fuel flow control valve.

4,627,235

COMPACT ELECTROHYDRAULIC DRIVE FOR VALVES OF TURBOMACHINES, ESPECIALLY TURBINES

Wolfgang Kindermann; Ernst Kloster; Hans-Joachim Leupers, and Helmut Schaper, all of Mülheim/Ruhr, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Mar. 14, 1984, Ser. No. 589,661

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309421; Jan. 9, 1984, 3400488

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—415 11 Claims

1. Electrohydraulic compact drive for turbomachine valves having valve housings and spindles, comprising:

means for supplying electric power and for receiving electrical addressing signals;

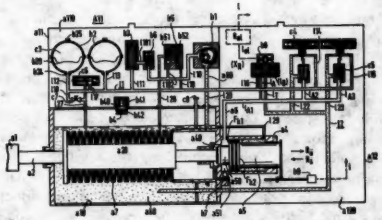
means connected to said supplying and receiving means for converting said signals into corresponding hydraulic positioning and control variables;

a self-sufficient hydraulic supply system including a hydraulic fluid tank for hydraulic fluid connected to said converting means, means for cooling the hydraulic fluid, at least one fluid pump having an inlet side fed by said fluid tank and an outlet side, an electric motor driving said fluid pump, at least one hydraulic accumulator with a given usable volume connected to said outlet side of said pump, and a hydraulic manifold connected to said at least one accumulator;

a hydraulic power system including a control cylinder, a power piston movable in said cylinder, a piston rod connected from said piston to the valve spindle of a turbomachine valve, and shutoff spring biasing said piston with a closing motion in a closing direction of the valve spindle, said shutoff spring being formed as a stack of cup springs;

an electrohydraulic addressing system including control means connected to said hydraulic manifold, to said hydraulic power system and to said hydraulic fluid tank for generating a pressurized fluid flow from said at least one accumulator to said hydraulic power system causing an opening motion of the valve spindle against the force of said shutoff spring dependent upon said positioning and control variables;

said control means of said electrohydraulic addressing system, said hydraulic power system and said hydraulic supply system being integrated into a compact drive block disposed at the housing of a turbomachine valve;



said at least one gluid pump producing a system pressure at said outlet side thereof up to a given pressure limit, said system pressure being several times higher than the fluid pressure of substantially 36-bar in conventional electrohydraulic control drives with a central fluid pressure supply;

minimum and maximum pressure switch means for connecting said outlet side of said at least one fluid pump intermittently to a pressure line for charging said at least one accumulator and to an outlet side of said hydraulic fluid tank;

said pressure switch means enabling said at least one pump to charge said at least one accumulator in said charging operation until said upper charging pressure is reached and returning the hydraulic fluid to said hydraulic fluid tank in substantially pressureless circulating operation after one of said switching operations, until said lower charging pressure is reached and one of said switching operations switches to said charging operation depending on said pressure limit;

housing sections of said hydraulic supply system, said hydraulic power system and said electrohydraulic addressing system, a central supporting cup-shaped housing for said housing sections,

said shutoff spring being guided on said piston rod,

said hydraulic fluid tank being in the form of an installation space for said shutoff spring and said cup-shaped housing; and

said usable accumulator volume and said lower charging pressure being sufficiently high for extreme control processes such that:

$$AV = \int_{P_{min}}^{P_m} pdv$$

is available, where

AV is the work capacity of said at least one accumulator,

P_{min} is the minimum operating pressure of said supply system,

P_m is said lower charging pressure, and

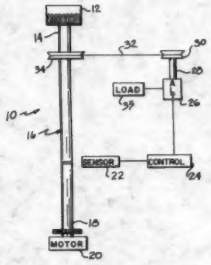
dv is the time-dependent increase of the equalizing volume of said accumulator for decreasing accumulator pressure.

4,627,236

APPARATUS AND METHOD FOR CONTROLLING THE SPEED OF ROTATION OF SHAFT

Michael Melnyk, Jr., Chester, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed May 29, 1984, Ser. No. 614,842
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—435 **3 Claims**



1. In an apparatus having shaft means with a driven end portion rotatably driven by an air motor and a driving end portion rotating a centrifugal molten metal casting pot, the improvement comprising speed control means for maintaining the speed of rotation of the driving end portion of the shaft means at a predetermined speed, the driven end portion of the shaft means being at a driven speed greater than the predetermined speed, said speed control means comprising:

sensing means for sensing and for generating a first signal representative of the sensed speed of rotation of the shaft means;

means for comparing said first signal with a second signal representative of the predetermined speed and for generating a control signal representative of the comparison; and

electrically actuated brake means responsive to said control signal for applying a braking force to the shaft means when power is supplied to said apparatus and for applying no braking force when power is not furnished said apparatus to thereby allow rotation of said shaft means at the driven speed, the braking force being proportional to said control signal so that the braking force maintains the speed of rotation of the driving end portion of the shaft means at the predetermined speed, said brake means comprising an alternator having a shaft, and belt means for operatively associating said alternator shaft with the driving end portion of the shaft means, said control signal being fed to the field of said alternator so that the force opposing rotation of said alternator shaft is representative of the magnitude of the control signal, changes in the strength of the field exerting a varying braking force on said alternator shaft and on said belt means which is transmitted to the driving end portion of the shaft means to

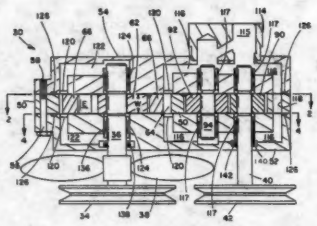
thereby maintain the speed of rotation of the driving end portion of the shaft means at the predetermined speed.

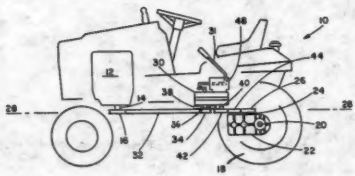
4,627,237

HYDROSTATIC TRANSMISSION WITH FIXED FLUID CAPACITY RATIO BETWEEN PUMP AND MOTOR

Allan I. Hutson, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 30, 1984, Ser. No. 595,167
Int. Cl.[4] F16D *33/02*
U.S. Cl. 60—487 23 Claims





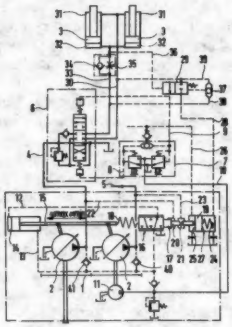
1. A hydrostatic transmission comprising a hydraulic pump driven by an input shaft and in fluid communication with a hydraulic motor having an output shaft, said pump having a pump rotating element which at least in part generates a pumping action and is operatively connected to said input shaft, said motor having a motor rotatable element operatively connected to the output shaft and subjected to fluid flow from said pump and at least in part providing a rotating output to said output shaft, a housing having a center section of uniform width and located between a pair of side sections, said center section being provided with a first opening of uniform cross section at least in part forming a pumping chamber and extending the width of said center section, said center section having a second opening of uniform cross section at least in part forming a motor chamber and also extending the width of said center section, said center section being of substantially the same width as said pumping chambers, said pumping chamber containing said pump rotating element with the fluid capacity of said pump being substantially proportional to the width of said pumping chamber, said motor chamber containing said motor rotatable element with the fluid capacity of said motor being substantially proportional to the width of said motor chamber, and said pumping chamber and said motor chamber being in side-by-side relationship, and wherein a transmission of selectable capacity which can be obtained by utilizing a common pair of housing side sections and selecting a width of the center section to provide the desired transmission capacity and wherein a ratio of pump capacity to motor capacity remains constant regardless of the width of center section selected.

4,627,238

OUTPUT CONTROL APPARATUS FOR A HYDROSTATIC DRIVE WITH DELIVERY ADJUSTMENT

Albert Mayr, Senden, and Oskar Stickel, Langenau, both of Fed. Rep. of Germany, assignors to Hydromatik GmbH, Elchingen, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 660,384
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1983, 3340332
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—452 2 Claims



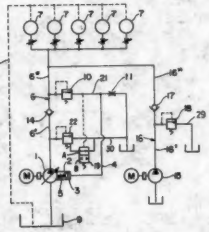
1. Output control apparatus for a hydrostatic drive in an open circuit having a device for regulating the delivery of a hydraulic pump of the drive, including a regulating piston having a piston surface acted upon by a regulating pressure; a path measuring spring having one end biased against said regulating piston; an output valve having a spool subjected to a biasing action from the other end of said path measuring spring, said output valve controlling the regulating pressure acting on the regulating piston; said drive being connected to said pump, said spool of said output valve being subjected to the pressure of the working medium of the hydrostatic drive against the force of the path measuring spring, said spool being stressed against the path measuring spring in the "minimum delivery" switch position when said hydraulic pump is not under load, a control piston being operatively connected with said spool; a pressure spring retaining said control piston against the force of the path measuring spring in contact with said spool, and said pressure spring holding the spool in the direction of the "minimum delivery" switching position of the hydraulic pump, means for subjecting a first piston area of said control piston to an adjustable control pressure against the force of the pressure spring, which pressure determines the power consumption of a load which is driven by the hydrostatic drive, means for imparting a restoring pressure to a second piston area of said control piston in the direction of the force of the pressure spring, in which the restoring pressure corresponds to a prescribed working pressure when there is a return movement of the load with reduced power consumption, said hydrostatic drive including a working piston having first and second areas subjected to a working medium for moving a load back and forth; a control valve being connected with a pressure line for the supply of said working medium to said working piston for effecting a return movement of the load; and a contact valve opening responsive to the working pressure in a pressure line connected to the working piston for effecting a forward movement of the load and transmitting the working pressure for the return movement of the load as a restoring pressure to the second piston area of the control piston.

4,627,239

HYDRAULIC CIRCUIT ARRANGEMENT

Hisaaki Nishimune, Akashi; Yoshikuni Ichimura, Kobe, and Kentaro Hata, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Continuation-in-part of Ser. No. 271,712, Jun. 8, 1981, abandoned. This application Jan. 28, 1985, Ser. No. 695,744
Claims proirity, application Japan, Jun. 6, 1980, 55-79572[U]; Jun. 6, 1980, 55-76893
Int. Cl.[4] F16H *39/46;* F15B *13/06*
U.S. Cl. 60—484 3 Claims



1. Hydraulic circuit arrangement for operating a plurality of actuators by means of a pressurized fluid, comprising

a variable displacement type main pump having a regulator attached thereto for controlling the discharge rate of the main pump while holding the pressurized fluid from the main pump constant, said main pump including a high pressure line extending from the main pump to the actuators for transmitting the pressurized fluid to the actuators to substantially operate all the actuators by the pressurized fluid from the main pump when operated,

a check valve situated in said high pressure line to prevent the pressurized fluid from flowing back to the main pump, said check valve dividing the high pressure line into a pump line and an actuator line,

an auxiliary pump having a delivery line connected to said actuator line, said auxiliary pump transmitting pressurized fluid to the actuator line at a pressure higher than that of the main pump, volume of the pressurized fluid from the auxiliary pump being less than that of the main pump,

means for controlling the regulator situated between the actuator line and the regulator to change the operating condition of the main pump so that when the actuators are not operated, the pressurized fluid from the auxilary pump flows into the regulator thorugh the means for controlling the regulator to thereby operate the main pump at a minimum operating condition, and when the actuators are operated, the pressurized fluid from the auxiliary pump flows into the actuators and substantially no pressurized fluid flows into the regulator through the means for controlling the regulator to thereby operate the main pump at a regular operating condition, said means for controlling the regulator substantially preventing the pressurized fluid of the main pump from passing therethrough when the main pump fully operates, whereby the actuators are operated by the pressurized fluid flowing from the main pump and the auxiliary pump, and

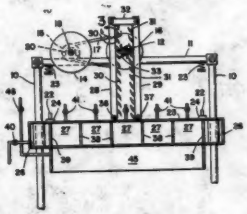
means for relieving the main pump pressure situated between the pump line and the downstream side of the means for controlling the regulator so that when the pressurized fluid from the auxiliary pump is applied to the regulator, the pressure relieving means operates to allow the fluid from the main pump to pass therethrough for exhausting the fluid outwardly, and when the pressurized fluid from the auxiliary pump is not substantially applied to the regulator, the pressure relieving means operates to allow the fluid from the main pump to flow to the actuators, said pressure relieving means including a relief valve connected to the pump line for exhausting the pressurized fluid outwardly, and a directional control valve connected between the relief valve and the downstream side of the means for controlling the regulator, said directional control valve, when detecting the pressurized fluid above a predetermined pressure passing through the regulator control means, allowing the relief valve to open for exhausting the fluid from the main pump outwardly, and when detecting the pressurized fluid below the predetermined pressure passing through the regulator control means, allowing the relief valve to cloase for directing the fluid from the main pump to the actuators, the relief valve being automatically opened to relieve pressure in the pump line when pressure in the pump line exceeds a predetermined level.

4,627,240

WAVE POWERED MACHINE

William A. Holmes, 209 Highland Ave., Piedmont, Calif. 94611

Filed Feb. 27, 1981, Ser. No. 238,696
Int. Cl.[4] F03B *13/12*
U.S. Cl. 60—507 11 Claims



1. A device to convert the motion of waves in a body of water to other forms of energy comprising:

a. vertical supports fixed to the bottom of said body of water,

b. rail means supported by said vertical supports,

c. a frame fixed to said vertical supports at an elevation above the surface of said body of water,

d. a shaft supported on said frame to rotate,

e. rotating means fixed to said shaft,

f. a float engaged with said rail means to move vertically up and down from the influence of waves, said float carrying actuating means in the form of two vertical racks pivotally connected to said float and with their upper extremities pivotally connected to a common link, one of said racks adapted to drive said rotating means on an upstroke of said float and the other of said racks to drive said rotating means on a downstroke of said float, said actuating means cooperating with said rotating means to cause said rotating means to rotate unidirectionally during a power stroke of said actuating means,

g. a power take-off from said shaft, and

h. said float having a skirt fixed to the bottom thereof, said skirt having means to vent the space beneath it.

4,627,241

CLOSED LOOP SOLAR COLLECTOR SYSTEM POWERING A SELF-STARTING UNIFLOW STEAM ENGINE

Barry W. Johnston, 1622 Q St., Washington, D.C. 20009

Division of Ser. No. 520,240, Aug. 4, 1983. This application Sep. 17, 1984, Ser. No. 650,887
Int. Cl.[4] F01L *21/02, 33/00;* F01K *13/02*
U.S. Cl. 60—656 10 Claims

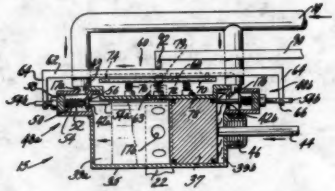
1. A uniform engine comprising:

(a) a cylinder having a pair of inlet openings respectively located at opposite ends thereof and a central discharge port between the inlet openings;

(b) a piston movable within said cylinder and including a drive shaft connected for delivery of power;

(c) first and second normally closed poppet inlet valves respectively located to open and close each inlet opening, each poppet valve being opened upon contact with said piston traveling into an end of stroke position to admit pressurized fluid into one of a pair of cylinder chambers located respectively on opposite ends of the piston, said chamber communicating with a source of pressurized fluid through the first and second valves; and

(d) a connecting rod simultaneously engageable with a valve rod of each said inlet valve for coordinating opening and closing of each of said first and second valves when pressure of fluid supplied to said engine is below a predetermined pressure level, including detent means for retaining said connecting rod means in a stationary position to maintain the first valve open and the second valve closed as said piston travels out of contact with the first valve, said connecting rod means being movable to close the first valve and open the second valve when the piston contacts the second valve with a force sufficient to overcome the bias of the detent means, said connecting rod means and detent means thereby maintaining one of said first or second valves open and the other valve closed when pressure of fluid is below said predetermined level to enable start-up of said engine and operation thereof in a non-expanded piston state.



4,627,242

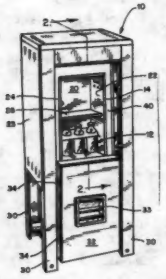
THERMOELECTRIC COOLER

Shlomo Beitner, Tel-Aviv, Israel, assignor to Vapor Corporation, Chicago, Ill.

Filed Apr. 19, 1984, Ser. No. 601,994

Int. Cl.[4] F25B *21/02*

U.S. Cl. 62—3 **8 Claims**



1. A thermoelectric cooler, comprising:

a storage compartment for the storage of items therein,

at least one, separate, detached coupling pad fabricated of thermoconductive material,

means for attaching said coupling pad onto said storage compartment,

a thermoelectric module secured to said pad with the cold face of said module against said pad; and

means mounting a heat exchanger on the hot face of said module in heat transfer relationship comprising;

at least two fasteners, a support bar and a spot shim between said heat exchanger and said support bar.

4,627,243

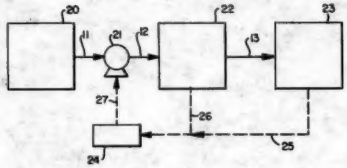
GAS SUPPLY SYSTEM FOR VARIABLE DEMAND APPLICATION

Herbert R. Schaub, Amherst, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 26, 1985, Ser. No. 780,278

Int. Cl.[4] F17C *7/04*; F04B *49/00, 49/06, 11/00*

U.S. Cl. 62—52 **22 Claims**



1. A method for providing gas to a variable consumption flowrate use point comprising: pumping liquid at an initial flowrate to a high pressure with a variable speed liquid pump having a maximum flowrate capability at least twice its minimum flowrate capability, vaporizing high pressure liquid to produce high pressure gas, passing high pressure gas to a high pressure gas storage tank, delivering high pressure gas from the storage tank to the use point, monitoring the use point consumption flowrate of said gas, determining if the use point consumption flowrate differs from the liquid pump initial flowrate, and, based on this determination, adjusting the liquid pump speed to provide a flowrate corresponding to the use point consumption flowrate, whereby the size of the high pressure gas storage tank is significantly reduced.

4,627,244

CRYOGENIC COOLING

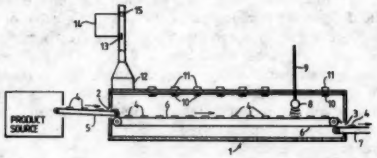
Edward M. A. Willhoft, 41, Higher Green Epsom, Surrey KT17 3BB, England

Filed Apr. 9, 1985, Ser. No. 721,416

Claims priority, application United Kingdom, Apr. 13, 1984, 8409692; Feb. 7, 1985, 8503122

Int. Cl.[4] F25D *13/06*

U.S. Cl. 62—63 **6 Claims**



1. A process for carrying out the cryogenic cooling of a material which comprises introducing material to be cooled into an elongated cryogenic tunnel housing on means for conveying said material from an inlet end to an outlet end, spraying liquid cryogen onto said material as it travels through said tunnel at a position proximate said outlet end, passing vapor or gas derived from said liquid cryogen in counter-current flow over said material passing through the tunnel, removing from said tunnel at a position proximate said inlet end an exhaust comprising said vapor or gas and atmospheric air entrained

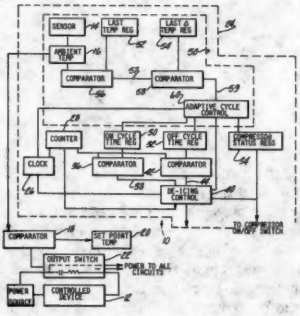
thereby through said inlet end, determining the rate of flow of the exhaust and the content of molecular oxygen in said exhaust, calculating from the rate of flow of the exhaust and its oxygen content the rate of consumption of said liquid cryogen, relating the rate of consumption of said liquid cryogen to the rate of production of cooled material and controlling the operation of the tunnel to optimize the weight ratio of liquid cryogen consumed/cooled material.

4,627,245

DE-ICING THERMOSTAT FOR AIR CONDITIONERS

Michael R. Levine, Ann Arbor, Mich., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 8, 1985, Ser. No. 699,580
Int. Cl.[4] G05D *23/32*
U.S. Cl. 62—157 **4 Claims**



1. In an electronic thermostat adapted to be connected to an air-cooling apparatus to control the operative state of the apparatus and including means for generating a digital electrical signal representative of a desired temperature setpoint and means for generating a digital electrical signal representative of the ambient temperature at the thermostat, the improvement comprising:

means for generating control signals for the aircooling apparatus in order to inhibit the accumulation of ice on the cooling element of the air-cooling apparatus when the ambient temperature is above the temperature setpoint;

means, responsive to the control signals, for deenergizing the compressor in the air-cooling apparatus for a first preselected period of time whenever the compressor is determined to have run continuously for a second preselected period of time; and

means for adaptively adjusting the length of at least one of the first or second preselected periods of time as a function of the change in the rate of change of the ambient temperature.

4,627,246

REFRIGERATOR COMPARTMENT PARTITION AND METHOD OF ASSEMBLY

Arthur C. Wilson, Louisville, Ky., assignor to General Electric, Louisville, Ky.

Filed Jul. 2, 1984, Ser. No. 627,199
Int. Cl.[4] F25D *21/14*
U.S. Cl. 62—286 **8 Claims**

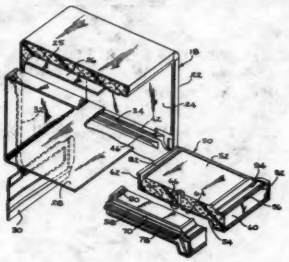
1. Compartment partition assembly for a refrigerator cabinet of the type having an outer shell, an inner liner with a rear wall and side walls and a partition separating the freezer and fresh food compartments comprising:

a sheet metal evaporator in the freezer compartment with one portion forming the bottom wall of the freezer compartment and a portion of the evaporator extends downwardly into the fresh food compartment,

a channel having a bottom and upper and lower side walls formed on each of the side walls of the liner,

a plate defining the top wall of the fresh food compartment, and

an insulating member forming a thermal compartment divider under the bottom wall of the freezer compartment and having top, bottom, side, front and rear walls, the bottom wall of which overlies said plate, said top wall formed to provide a drain and sealing system having troughs with exterior walls along the periphery of the top



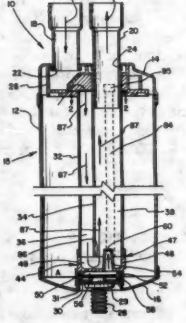
wall adjacent the side and rear walls of the insulating member and deflected inwardly by the rear wall of the liner and upper side walls of the liner channels, said top wall having two troughs with exterior walls along the periphery of the top wall adjacent the rear wall of the insulating member and they are spaced apart to accommodate the evaporator portion extending from the freezer into the fresh food compartment and the two troughs are inclined downwardly toward each other and there are drain openings through the insulating member at the lowest end of each of the respective troughs.

4,627,247

SUCTION ACCUMULATOR

Robert L. Morse, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Mar. 21, 1986, Ser. No. 842,311
Int. Cl.[4] F25B *43/00*
U.S. Cl. 62—503 **26 Claims**



1. A suction accumulator comprising:

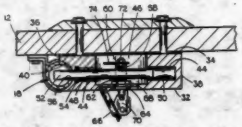
a storage vessel including a casing having a first end wall and defining a liquid storage volume;

an inlet for said vessel;

a first conduit disposed in said vessel, said conduit having first and second ends, said conduit including a divider

means for forming first and second fluid passageways in said conduit, said first fluid passageway being open to said vessel at said conduit first end;
an outlet for said vessel connected to said second fluid passageway at said conduit first end;
a transition member secured to said conduit second end and forming a third fluid passageway, said third fluid passageway interconnecting said first fluid passageway and said second fluid passageway; and
a second conduit extending from said liquid storage volume into said second fluid passageway.

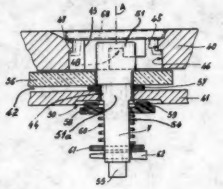
4,627,248
TRAILER DOOR LOCK SYSTEM
David L. Haworth, Papillion, Nebr., assignor to Sentry Lock Co., Inc., Gretna, Nebr.
Filed Sep. 23, 1985, Ser. No. 779,041
Int. Cl.[4] E05C *3/14*; E05B *65/14*
U.S. Cl. 70—134 **12 Claims**



1. A lock system for a conventional vehicle cargo door having a vertical lock bar rotatably mounted thereon, said lock system comprising,
a housing having a front wall, a flat back wall adapted for placement against a cargo door and transversely spaced-apart opposite side walls,
said vertical lock bar being of the type mounted for rotation about its own vertical axis,
one side wall of said housing including a vertically extended groove adapted for receiving the rotatable cargo door lock bar, said one side wall further having an opening in communication with said groove,
means for securing said housing to a cargo door at a position with the rotatable lock bar received within said groove,
an elongated lock pin,
means for supporting said lock pin for transverse sliding movement in said housing and through said side wall opening into said groove for insertion into a registered hole in a cargo door lock bar,
a key operated lock shaft supported on said housing generally perpendicular to the lock pin, and
a rocker arm secured to said lock shaft for rotation therewith and having a free end connected to said lock pin for transverse movement of the lock pin in response to rotation of said lock shaft.

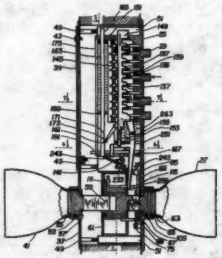
4,627,249
LATCH FOR UTILITY ACCESS DOOR
Robert Dumortier, 9 rue Duchartre, 34500 Beziers (Herault), France
Filed Sep. 12, 1985, Ser. No. 775,079
Claims priority, application France, Sep. 12, 1984, 84 14229
Int. Cl.[4] E05B *65/06*
U.S. Cl. 70—139 **5 Claims**

1. A latch assembly comprising:
relatively fixed and fixed inner and outer plates defining a space and formed with respective inner and outer bores aligned along a common axis, the outer plate being formed at its bore with at least one radially extending formation and the inner plate being formed adjacent its bore with at least two angularly offset and axially extending formations;
a plug extending through the bores and rotatable therein about the axis, the plug having an outer head in the outer bore and accessible from outside the plates and an opposite inner end exposed inward past the inner plate;
a locking dog extending radially from and angularly fixed to the plug in the space between the plates;
an inner abutment washer secured to the inner end of the plug and spaced axially inward of the inner plate;
a retaining washer angularly nondisplaceable on the inner end of the plug having an axially extending formation engageable with the formations of the inner plate;
a compression spring braced between the washers and



urging the formation of the retaining washer axially outward toward the inner plate;
a key engageable with the plug head and having an axially extending formation complementary with the formations of the outer plate, the plug with the pawl and retaining washer being angularly displaceable about the axis between a locking position in which the formations of the key and outer bore can interfit and the formation of the retaining washer engages one of the formations of the inner plate and a freeing position in which the formations of the key and outer bore cannot interfit and the formation of the retaining washer engages the other of the formations of the inner plate; and
a formation on the inner end of the plug adapted to be engaged for rotation of the plug from inside the inner plate.

4,627,250
COMBINATION LOCK
Sung B. Kim, 4418 Pickett Rd., Fairfax, Va. 22032
Filed May 22, 1984, Ser. No. 613,042
Int. Cl.[4] E05B *37/00*
U.S. Cl. 70—214 **27 Claims**



1. A combination lock comprising:
a plurality of user-operable means operable through an operating stroke between first and second positions;
first counter means for counting operating strokes including a respective first movably mounted member movable from an intial position to successive unique positions in response to successive operating strokes;
second counter means for counting operating strokes includ-

ing a respective second movably mounted member movable from an initial position to successive unique positions in response to successive operating strokes;

combination setting means for connecting selected ones of said user-operable means to said first counter means to enable counting by said first counter means of the operating strokes of said selected user-operable means and for connecting the non-selected ones of said user-operable means to said second counter means to enable counting by said second counter means of the operating strokes of said non-selected user-operable means;

third counter means responsive to each operating stroke of said selected and non-selected user-operable means for counting the operating strokes thereof and including a respective third movably mounted member movable from an initial position to successive unique positions in response to each successive operating stroke of said selected and non-selected user-operable means; and

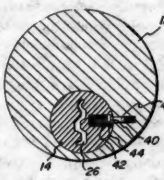
interlock means movable from an initial position to a second position when said first counter means counts a predetermined number of operating strokes of said selected user-operable means, said second counter means has not counted operating strokes of said non-selected user-operable means, and said third counter means has counted a predetermined number of operating strokes of said selected and non-selected user-operable means.

4,627,251

COMBINED MECHANICAL AND MAGNETIC LOCKING SYSTEM

Suresh K. Bhate, 1154 Mohawk St., Schenectady, N.Y. 12309

Filed Sep. 17, 1984, Ser. No. 651,171
Int. Cl.⁴ E05B 27/06, 47/00
U.S. Cl. 70—276 **2 Claims**



1. A lock mechanism comprising:

an outer cylinder;

an inner cylinder rotatably mounted within said outer cylinder for movement between a lock and open position, said inner cylinder having a keyhole therein;

a set of mechanical tumblers moveable between a lock position wherein each tumbler blocks the space between the cylinders thereby preventing rotation of the inner cylinder, and a release position where in each mechanical tumber does not block the space between the cylinders and thereby allows the inner cylinder to rotate;

at least one magnetically attractable tumbler, which is not a magnet, also moveable between a lock position wherein the separation between the inner and outer cylinders is traversed and the inner cylinder is prevented from rotating, and an open position wherein the space between the inner and outer cylinders is not traversed and the inner cylinder can rotate to its open position, said magnetically attractable tumbler being spring-biased to the lock position; and

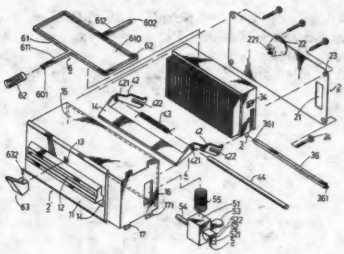
a second tumber having a base and a separate stud portion, said tumbler being made of material which is not a magnet but is magnetically attractable, and positioned within the cylinders for movement between a release position wherein the space between the cylinders coincides with the space between the base and the stud, and a lock position wherein the stud traverses the space between the cylinders, said base being spring-biased to the open position and another spring biasing the stud to the base and pressing the stud toward the lockd position, such that when attracted by a magnet placed within the keyhole at a position adjacent to said second magnetic tumbler, the magnetic force, when sufficient, compresses the base biasing spring and said stud spring moves the stud to the lock position traversing the space between the cylinders.

4,627,252

CODED-CARD TYPE LOCK DEVICE

Chi-Woei Lo, 39, New Village, Fu-Shin-Li, Miao-Li City, Taiwan

Filed Nov. 14, 1985, Ser. No. 797,839
Int. Cl.⁴ E05B 23/00
U.S. Cl. 70—351 **8 Claims**



1. A coded-card type lock device comprising in combination:

an outer housing body with an open section at one side, a panel plate formed on another side, a bolt opening and a plurality of anchoring studs provided at a front portion for being fixed at a proper location in a door, said panel plate including a key slot horizontally formed in the middle, a rod opening located at a place over the key slot, and a plate trough below and parallel to the key slot for being exposed on the outer surface of the door;

a locking means with a plurality of coded and movable locking pieces fixedly installed in said outer housing body with a line of said coded and movable locking pieces exposed along the key slot for performing locking and unlocking operations;

an operating means with a press member and a turning arrangement movably installed in said outer housing body under said locking means with the press member extending out of the key slot for controlling the unlocking operation in conjunction with said locking means;

a lock bolt mechanism having a bolt head and a projecting member flexibly installed in the front portion of said outer housing body with the bolt head extending out of the bolt opening for being moved up and down along with said operating means to effect the locking and unlocking operations;

a resetting member formed in a rectangular frame structure with a first linking rod at one side and a second linking rod at another movably installed around an upper periphery of said locking means in said outer housing body with the first linking rod extending out of the rod opening of outer housing body for resetting the locking pieces of said locking means to their coded positions therein;

an elastic element coupled with the first linking rod in said outer housing body for applying an elastic force to said resetting means;

a hand grip connected to the first linking rod at the panel plate of said outer housing body for operating said restoring means;

an inner covering member with a knob opening at one side

and a cone-shaped connecting part with an orifice in its center formed at an upper portion thereof connected to said outer housing body over the open section thereof with the second linking rod movably connected to the cone-shaped connecting part;

a bolt socket frame having a locked space defined therein accommodating the bolt head of said bolt mechanism for being fixed on a door post opposite to the front portion of said outer housing body; and

a card-type key having a plurality of segmented tooth-like sections formed at one side, in cooperation with the key slot of said outer housing body, for being coded according to a code arrangement of the locking pieces of said locking means; whereby, the lock device can be locked and unlocked conveniently with a high standard of security.

4,627,253

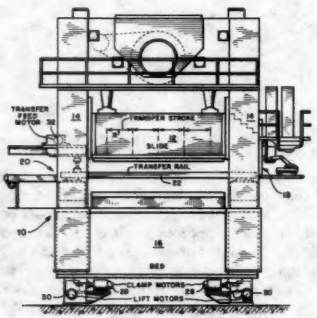
FAULT DETECTION SYSTEM FOR CONTINUOUSLY RUNNING TRANSFER PRESS

Rick L. Tennessen; Harry W. Schulz, both of Racine, Wis., and Allen J. Vanderzee, Lansing, Ill., assignors to Verson Allsteel Press Co., Chicago, Ill.

Filed Jul. 25, 1984, Ser. No. 634,159

Int. Cl.[4] B21D *55/00*

U.S. Cl. 72—4 **18 Claims**



1. In a continuously running transfer press of the type comprising at least one die which moves in a cycle, a workpiece transfer system having at least one axis of movement, and a controller comprising means for sensing the phase angle of the die in the cycle and means for controlling the transfer system to synchronize movement of the transfer system with the phase angle of the die in the cycle, the improvement comprising:

a die position sensor mounted to the transfer press to generate a die position signal indicative of the momentary position of the die in the cycle at a multiplicity of phase angles of the die in the cycle;

at least one transfer system position sensor mounted to the transfer press to generate at least one transfer system position signal indicative of the momentary position of the transfer system in at least one selected axis at said multiplicity of phase angles;

a fault detection system responsive to the at least one die position signal and the transfer system position signal, said fault detection system comprising means for comparing the die position signal and the transfer system position signal at said multiplicity of phase angles of the die in the cycle, and means for generating at least one fault signal in the event the at least one transfer system position signal faults to correspond to a predetermined function of the die position signal;

said die position sensor, at least one transfer system sensor and fault detection system cooperating to monitor the operation of the transfer system and the controller independently of the controller and to generate the at least one fault signal in the event the transfer system loses synchronization with the die.

4,627,254

CUTTING DEVICE FOR A MULTI-DIMENSIONAL BENDING APPARATUS

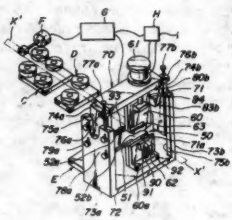
Motohiko Kitsukawa, and Atsuo Suzuki, both of Yokohama, Japan, assignors to Hashimoto Forming Industry Co., Ltd., Yokohama, Japan

Filed Jan. 29, 1985, Ser. No. 696,199

Claims priority, application Japan, Jan. 30, 1984, 59-14793; Jan. 30, 1984, 59-14794; Jan. 31, 1984, 59-15925; Jan. 31, 1984, 59-15926; Jan. 31, 1984, 59-15927; Jan. 31, 1984, 59-15928; Sep. 28, 1984, 59-203868

Int. Cl.[4] B21D *11/14, 43/28*

U.S. Cl. 72—6 **4 Claims**



1. A cutting device for a multi-dimensional bending apparatus for producing multi-dimensionally bent elongate articles, such as door sashes, various moldings for automobiles, and the like, and including a bending device for multi-dimensionally bending continuously supplied elongate material, wherein the cutting device comprises a fixed blade member formed therein with an opening through which the multi-dimensionally bent material is passed, and a movable blade member vertically movable with respect to, and kept in sliding contact with the fixed blade member, cutting edges being formed by the lower peripheral edge of the opening in the fixed blade member and the lower edge of the movable blade member, said blade members being movable also in the direction in which the material is supplied, synchronously with the cutting of the supplied material, said movable blade member having a lower dead point and being formed with a slit having a side aperture, which slit can be brought into alignment with the opening in the fixed blade member in the lower dead point of the movable blade member such that continuously supplied material is permitted to pass through the slit upon completion of the cutting, said slit having a width smaller than the maximum lateral excursion of the bent material and means to upwardly move the movable blade member to its original position when the bent material moves laterally out of said slit.

4,627,255

APPARATUS FOR BENDING METAL STRIP

John R. Archer; Michael J. Kellaway, both of Royston, and Douglas S. MacArthur, Haslingfield, all of England, assignors to USM Corporation, Farmington, Conn.

Filed Feb. 1, 1984, Ser. No. 575,793

Claims priority, application United Kingdom, Feb. 12, 1983, 8303954

Int. Cl.[4] B21D *5/00*

U.S. Cl. 72—10 **4 Claims**

1. A machine for bending metal strip comprising

grounded guide means for guiding metal strip to an exit location,

a bending tool having a working surface for contacting the metal strip,

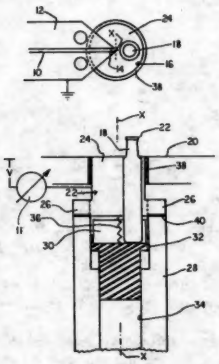
bending tool support means including

means for supporting said bending tool for displacement along an axis,

means for displacing said bending tool along said axis from a retracted position below the metal strip to an advanced bending position,

said bending tool being spaced from said exit location and mounted in said support means,

said bending tool being displaceable from a retracted position along a path normal to said axis to contact and bend the metal strip and being displaceable back to said retracted position,



means connected to said bending tool for applying a voltage potential directly to said working surface of said bending tool,

means connected to said bending tool for sensing the presence or absence of such applied voltage, and

insulating means for preventing such applied voltage from being grounded through said bending tool support means whereby when said bending tool contacts the metal strip, said sensing means will sense that the applied voltage has dropped to zero and determine the exact location of the metal strip at the moment of contact or at the moment when contact is broken.

4,627,256

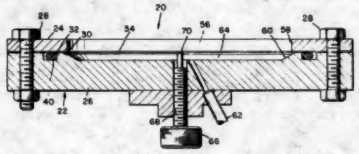
METHOD OF FORMING PRECISELY CURVED SURFACES

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 26, 1979, Ser. No. 106,985

Int. Cl.⁴ B21D *26/02, 22/10*

U.S. Cl. 72—60 **14 Claims**



1. A method for forming a precisely curved surface comprising the sequential steps of applying substantially uniform isotropic and radially extending forces upon a substantially planar plastically deformable blank, and plastically deforming the blank to permanently form the precisely curved surface.

4,627,257

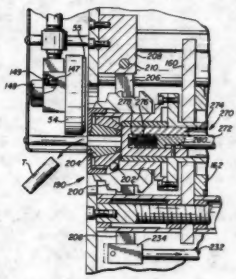
TUBE SPIN CLOSE APPARATUS

William G. McElhaney, Jacksonville, Tex., assignor to Collco, Inc., Dallas, Tex.

Filed May 5, 1980, Ser. No. 146,755

Int. Cl.⁴ B21D *15/00*

U.S. Cl. 72—102 **24 Claims**



1. Apparatus for substantially closing the end of a tube section comprising:

rotary means for rotating said tube section about the longitudinal axis of the tube section,

a forming wheel mounted relative to the end of said tube section, said forming wheel being freely rotatable about an axis substantially parallel to the rotational axis of the tube section, and

means for moving said forming wheel in a plane substantially perpendicular to the axis of rotation of the tube section into engagement with the end of the tube section and beyond the axis of rotation of the tube section to substantially close the end thereof.

4,627,258

APPARATUS FOR IMPRESSING A STRIP ALONG ITS EDGE

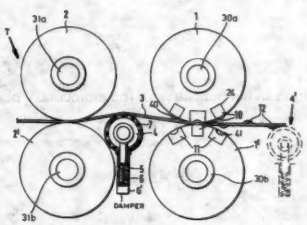
Hans J. Loges, and Hermann Wilkening, both of Düsseldorf, Fed. Rep. of Germany, assignors to IOG Industrie-Ofenbau Gesellschaft mit beschrankter Haftung, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,856

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 8419637[U]

Int. Cl.⁴ B21D *13/04, 37/04, 37/06*

U.S. Cl. 72—196 **18 Claims**



1. An apparatus for shaping a strip, comprising:

at least one pair of working rolls provided with forming tools spaced about their circumference for embossing an edge of the strip;

at least one pair of guide rolls located upstream of said pair of working rolls and running in synchronism with the advance speed of the strip;

a roller provided between said pair of working rolls and said pair of guide rolls and being movable in a direction perpendicular to the advance plane of the strip for deflecting the latter out of said plane;

a resilient means positioned perpendicular to said advance plane, supporting said roller and urging the roller to abut against the strip;

gear means including bevel gears and a connection shaft coupling with one another and said pair of working rolls to said pair of guide rolls wherein said pair of working rolls has a circumferential speed higher than the advance speed of the strip.

4,627,259

INDUCTIVE EDGE HEATING DEVICE FOR HOT WORKING STRIP MATERIAL AND THE LIKE

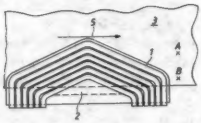
Lars Andersson; Hans Backlund; Bengt Henriksson, and Thomas Moström, all of Västerås, Sweden, assignors to Asea Aktiebolag, Västerås, Sweden

Filed Nov. 29, 1985, Ser. No. 802,724

Claims priority, application Sweden, Nov. 30, 1984, 8406062

Int. Cl.[4] B21B *45/00*

U.S. Cl. 72—202 **5 Claims**



1. An edge-region heating device for use in the rolling of an elongated metal member having edge regions and a central part between the edge regions, which edge regions are cooler than said central part, which edge-region heating device is arranged to contain one edge region of the elongated member for inductively heating the same, wherein the heating device includes an induction coil having a plurality of coil parts, each of which coil parts is bent into a V-shape around the said one edge region of the elongated metal member with the apex of each V being further away from the outer edge of the elongated metal member than the remainder of said coil part such that the outermost parts of the said one edge region will pass more of the coil parts than parts of the member located closer to the said central part, the said one edge region of the elongated member thereby being heated to a greater extent than said parts of the member located closer to said central part to reduce the temperature difference between the said one edge region and the said central part.

4,627,260

ROLLING STAND WITH AXIALLY SHIFTABLE ROLLS

Willi Benz, Neuss, Fed. Rep. of Germany, assignor to SMS Sloemann Siegmag AG, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 18, 1984, Ser. No. 631,916

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1983, 3325823

Int. Cl.[4] B21B *1/38, 31/18*

U.S. Cl. 72—247 **7 Claims**

1. A method of operating a roll stand comprising:

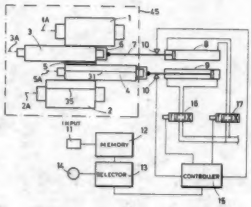
a support frame;

a pair of similar small-diameter working rolls rotatable about respective vertically spaced axes and defining a workpiece nip receiving a workpiece to be rolled;

a pair of similar large-diameter backup rolls rotatable about respective axes vertically flanking the working-roll axes and each bearing vertically on the respective working roll, the working rolls having ends and each having therebetween an effective axisl length equal to at least 1.3 times the effective axial length of the respective backup rolls; and

respective actuator means connected to the working rolls for displacing same axially relative to the backup rolls through an axial distance equal to about their own effective axial lengths between end positions each engaging only about half of the respective backup roll; the method comprising the steps of:

selecting from a group of to-be-rolled strips a subgroup of strips comprised generally of pairs of complementarily



width-matched strips wherein the combined width of the strips of each pair is generally equal to the working-roll width;

feeding to and through the stand the workpieces of the subgroup with the workpiece edges directed axially of the rolls; and

axially positioning the working rolls of the stand such that their ends are axially oppositely offset at one edge of one of the workpieces of each pair and so that the ends are axially oppositely offset and at the opposite edge of the other workpiece of the respective pair.

4,627,261

ROLL STAND WITH AXIALLY SHIFTABLE WORKING ROLLS

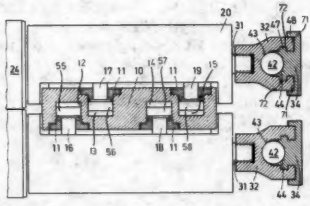
Günter Schiller, Kreuztal, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 14, 1985, Ser. No. 711,777

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409221

Int. Cl.[4] B21B *31/18, 31/32*

U.S. Cl. 72—247 **20 Claims**



1. In a roll stand comprising a plurality of axially shiftable working rolls, each of said working rolls having at least one structural member attached thereto; a plurality of guide pieces, each of said guide pieces having one of said working rolls connected axially slidably thereto by at least one of said structural members, said guide pieces being slidable substantially vertically along at least one cylinder block by at least one balancing hydraulic cylinder mounted in one of said cylinder blocks for balancing and working roll bending, and at least one of said guide pieces is associated with at least one axially shifting hydraulic cylinder which causes said axial shifting of one of

said working rolls, the improvement wherein a plurality of said balancing hydraulic cylinders acting upon said structural members having said working rolls connected thereto with balancing and bending forces are positioned in at least one projecting shoulder of said cylinder blocks, said balancing hydraulic cylinders are displaced from each other in a direction parallel to the axes said working rolls, each of said balancing hydraulic cylinders having a balancing cylinder piston rod, said balancing cylinder piston rods of said balancing cylinders taken individually along said direction parallel to said axis of said working rolls projecting alternately downward and upward from said shoulder to engage and act on said guide pieces of said working rolls, said axially shifting cylinder being located in said one of said guide pieces, a shifting cylinder piston rod of said axially shifting hydraulic cylinder being respectively provided with a coupling body attached to the free end of said shifting cylinder piston rod, said coupling body being connected to and providing a means of attachment to a lug jutting out from one of said structural members.

4,627,262

DEVICE FOR OPENING THE ROLL NIP IN AN APPARATUS COMPRISING A PAIR OF ROLLERS

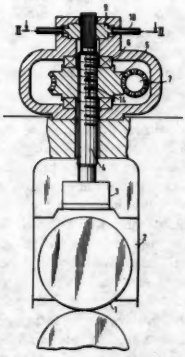
Heinrich Tödter, Nienhagen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Oct. 19, 1984, Ser. No. 662,638

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1983, 3339168

Int. Cl.[4] B21B *31/24*

U.S. Cl. 72—248 **5 Claims**



1. A device for rapidly opening the roll nip in an apparatus having a pair of rolls such as a calendar or the like, where each roll has first and second opposed ends, comprising:

(a) bearing blocks for mounting the first and second ends of one of said rolls,

(b) spindle means fixedly attached to each of said bearing blocks, an intermediate portion of said spindle means being exteriorly threaded,

(c) an axially fixed spur wheel positioned around each of said spindle means and internally threaded for engaging the threaded portion of said spindle means, and means for rotating said spur wheel, thereby providing axial adjustment of said spindle means for setting the adjustment of the roll nip, and

(d) auxiliary drive means independent of said spur wheel and directly engaging said spindle means, said auxiliary drive means being constructed and arranged so that when actuated, said auxiliary drive means causes simultaneous, direct and rapid axial movement of both of said spindle means, and thus said bearing blocks, in a direction away from the nip of the rolls, whereby the rolls are maintained out of contact with each other.

4,627,263

METHOD OF AND APPARATUS FOR MAKING SPACERS FOR USE IN MULTIPLE-PANE WINDOWS OR THE LIKE

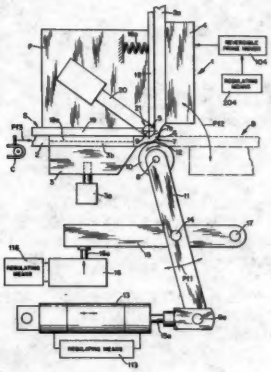
Franz Bayer, Elzach, and Karl Grosch, Wuppertal, both of Fed. Rep. of Germany, assignors to Franz Xaver Bayer Isolierglasfabrik, Elzach, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,444

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312764; Oct. 12, 1983, 3337058

Int. Cl.[4] B21D *9/15*

U.S. Cl. 72—298 **48 Claims**



1. A method of making a spacer for multiple-pane windows or the like, comprising the steps of at least partially filling a deformable circumferentially complete tubular blank with a desiccant; bending the blank through a preselected angle to form an elbow disposed between two neighboring sections and having a radailly inner and a radially outer wall; mechanically pasticizing and lengthening that portion of the blank which is being converted into the outer wall of the elbow; and expelling at least some desiccant from the elbow in the course of the plasticizing step.

4,627,264

CAM ACTUATED EJECTOR FOR A SHELL PRESS

Arthur L. Grow, Versailles; Charles J. Gregorovich, St. Marys, and Donald N. Seyfried, New Bremen, all of Ohio, assignors to The Minster Machine Company, Minster, Ohio

Division of Ser. No. 455,000, Jan. 3, 1983, Pat. No. 4,513,600. This application Jan. 31, 1985, Ser. No. 696,713

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—345 **10 Claims**

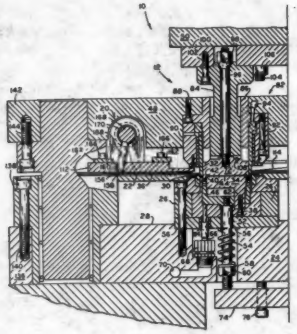
1. In a shell press having a crankshaft for reciprocating a slide adapted for having tooling mounted thereto and a forming station in which said tooling forms a shell, a shell ejector apparatus for ejecting formed shells comprising:

means for lifting a formed shell to a selected plane,

an ejector member having an end portion and being reciprocable in said plane, and

means constantly synchronized with said slide for positively driving said ejector member in said selected plane from a first position in said selected plane wherein said end portion is disposed out of said forming station and spacing from a position in the work station in which a shell to be ejected is normally supported to a second position in said

selected plane wherein said end portion is disposed in said forming station in a space normally occupied by a formed



shell to be ejected and from the second position back to the first position.

4,627,265

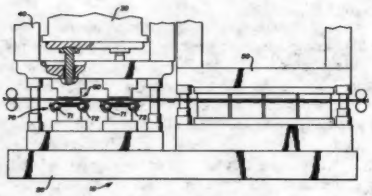
DOUBLE ACTION CONVERSION SYSTEM

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed Aug. 12, 1985, Ser. No. 764,716

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—354 **6 Claims**



1. A high speed, double acting conversion press having a press frame and press crown for producing easy-open container end pieces from plain end pieces, comprising:

(A) a motor driver crank carried by the press crown;

(B) a press bed;

(C) a first, inner slide carried by said crank within the press frame for independently controlled, vertical, reciprocal movement toward said press bed;

(D) a second, outer slide carried by said crank within the press frame for independently controlled, vertical, reciprocal movement toward said press bed;

(E) end piece conversion tooling carried by said second, outer slide;

(F) metal scoring tooling carried by said first, inner slide;

(G) a third slide carried by said crank within the press frame for independently controlled, vertical, reciprocal movement toward said press bed and disposed in side-by-side relationship with said first and second slides;

(H) tab forming tooling carried by said third slide;

(I) first feed means for advancing container end pieces through the press; and

(J) second feed means for advancing the tabs normally to the path of the end pieces.

4,627,266

SPINDLE PRESS WITH CONTINUOUSLY ROTATING FLYWHEEL

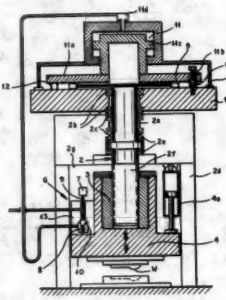
Heinz Siebold, Heidedyk 4, D-4150 Krefeld, Fed. Rep. of Germany

Filed Jun. 18, 1984, Ser. No. 621,497

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1983, 3322064

Int. Cl.[4] B21J *7/46*

U.S. Cl. 72—444 **8 Claims**



1. A spindle press comprising:

a press frame;

a spindle journaled in said frame and having a threaded portion;

a spindle nut threadedly engaging said threaded portion of said spindle and displaceable parallel to an axis thereof upon rotation of said spindle;

a ram forming a tool and connected to said nut for displacement thereby in a pressing direction upon rotation of said spindle in one sense;

a continuously rotating flywheel journaled on said frame;

a fluid-operated clutch actuatable to couple said flywheel with said spindle for rotating said in said sense;

a control unit including a control mass on said arm movable with at least its principal component of movement in said direction for deactivating said clutch upon retardation of the movement of said ram in said direction, and means applying a restoring force to said mass relative to said ram to return said mass to an original position after inertial displacement of said mass relative to said ram in said direction, said control unit including a valve connected to said clutch and having an actuating rod extending in said direction and movable in said direction, said mass being operatively connected to said rod; and

means varying said restoring force.

4,627,267

APPARATUS AND METHOD FOR DETERMINING THE FLOW CHARACTERSTIC OF A VOLUMETRIC FLOWMETER

Gary D. Cohrs, Tempe, and Edward E. Francisco, Jr., Paradise Valley, both of Ariz., assignors to Flow Technology, Inc., Phoenix, Ariz.

Filed Jul. 19, 1985, Ser. No. 757,272

Int. Cl.[4] G01F *25/00*

U.S. Cl. 73—3 **7 Claims**

1. A flowmeter calibrator comprising:

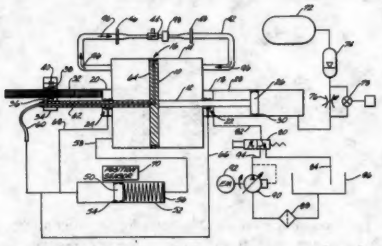
a fluid displacement measuring cylinder having at its respective ends an inlet and an outlet;

a fluid displacement measuring member adapted to travel through the measuring cylinder as a fluid barrier;

means for sensing the displacement of the measuring member as it travels through the measuring cylinder;

a fluid line external of the measuring cylinder connected

between the inlet and outlet thereof, the fluid line having a pressure null point along its length; and



a flowmeter connected in the fluid line at the pressure null point.

4,627,268

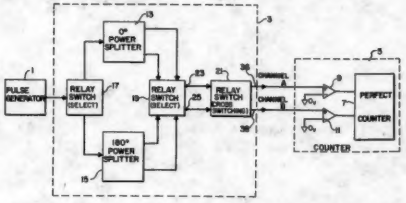
METHOD FOR CALIBRATING INSTRUMENTS FOR TIME INTERVAL MEASUREMENTS

David C. K. Chu, Woodside, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 19, 1985, Ser. No. 757,220

Int. Cl.[4] G01P *21/00*

U.S. Cl. 73—5 **11 Claims**



1. A method of calibration of a time-interval measuring apparatus having a plurality of signal channels comprising the steps of:

generating a test signal;

passively linearly splitting the test signal to form first and second coherent signals;

simultaneously a.c.-coupling the first coherent signal to a first respective channel and the second coherent signal to a second respective channel;

measuring the time interval between the coherent signals passing through the respective channels at an identical voltage level to provide a first result; and

using the first result to provide a calibration constant for the measuring apparatus.

4,627,269

METHOD OF, AND APPARATUS FOR, DETECTING REDUCING GASES IN A GAS MIXTURE

Martin Forster, Jona, and Sigfrid Strässler, Baden-Dättwil, both of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Mar. 18, 1985, Ser. No. 712,682

Claims priority, application Switzerland, Apr. 4, 1984, 1699/84

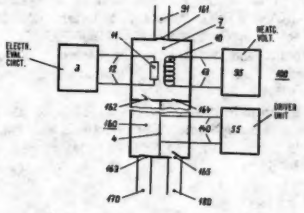
Int. Cl.[4] G01N *27/12*

U.S. Cl. 73—23 **121 Claims**

1. A method of detecting at least one reducing gas in a gas mixture to be investigated, particularly in air, said method comprising the steps of:

selecting a gas sensor containing a metal oxide semiconductor possessing a selected property which is dependent on the presence of said at least one reducing gas in said gas mixture;

cyclically varying the temperature of said gas sensor by continuously increasing said temperature from a starting value to an upper threshold value and subsequently decreasing said temperature from said upper threshold value to said starting value;



cyclically exposing said gas sensor to said gas mixture to be investigated and at least partially to a reference gas containing a smaller amount or none of said at least one reducing gas, whereby said selected property of said metal oxide semiconductor is subject to a cyclical variation as a function of time; and

measuring said cyclical variation of said selected property of said metal oxide semiconductor.

4,627,270

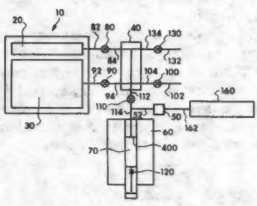
SYSTEM FOR MEASURING THE PORE VOLUME AND PERMEABILITY OF VERY TIGHT CORE PLUGS AND METHOD THEREFOR

Stanley C. Jones, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jan. 6, 1986, Ser. No. 816,608

Int. Cl.[4] G01N *15/08*

U.S. Cl. 73—38 **5 Claims**



1. A method for determining the pore volume of very tight core samples with an apparatus having a manifold in selective fluid communication with a sample holder holding said core sample, said sample holder having an outlet, said method comprising the steps of:

(a) sealing the outlet of the sample holder,

(b) pressurizing the manifold volume and the sample holder with a gas to a predetermined pressure, P_{FILL},

(c) sealing the core holder and pressure transducer from the manifold,

(d) waiting for the gas pressure in the core holder to reach a first equilibrium state, P_{E1},

(e) measuring the value of pressure P_{E1},

(f) venting the manifold to atmosphere so that the manifold pressure obtains zero psig,

(g) sealing the manifold in response to said venting so that the sealed manifold contains zero psig,

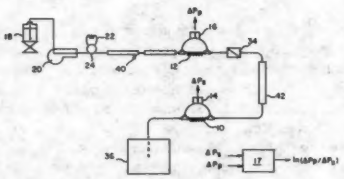
(h) delivering the pressurized gas at said first equilibrium pressure, P_{E1}, from the sample holder into the manifold,
(i) waiting for the delivered pressurized gas to reach a second equilibrium state, P_{E2},
(j) measuring the value of pressure PE2, and
(k) determining the pore volume, V_p, of the core plug in the sample holder based upon the measured values of pressures P_{E1} and P_{E2}.

4,627,271

DIFFERENTIAL PRESSURE CAPILLARY VISCOMETER FOR MEASURING VISCOSITY INDEPENDENT OF FLOW RATE AND TEMPERATURE FLUCTUATIONS

Scot D. Abbott, and Wallace W. Yau, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 669,017, Nov. 7, 1984, Pat. No. 4,578,990. This application Oct. 31, 1985, Ser. No. 792,041
Int. Cl.[4] G01N *11/04*
U.S. Cl. 73—55 **35 Claims**



1. A method of measuring either the intrinsic or inherent viscosity of a solute in solution with a solvent which is independent of flow rate and temperature fluctuations comprising the steps of:
passing the solvent through a first capillary tube,
passing the solution through a second capillary tube connected in series with the first capillary tube,
measuring separately the pressure drop ΔP_s across the first capillary tube and the pressure drop ΔP_p across the second capillary tube when each is full of flowing solvent and solution, respectively,
generating signals corresponding to the pressure drop across each capillary tube, and
feeding said signals to an amplification means selected from the group consisting of an analog divider or a high speed computer based on real time signal processing which processes the ratio of $\Delta P_p/\Delta P_s$ in real time for use in measuring either the intrinsic or inherent viscosity of the solute wherein the viscosity measured is independent of flow rate and temperature fluctuations.

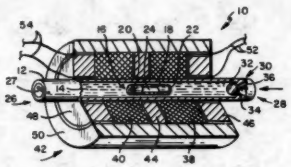
4,627,272

VISCOMETER

Hubert A. Wright, Cambridge, Mass., assignor to Cambridge Applied Systems, Inc., Cambridge, Mass.

Filed Nov. 28, 1984, Ser. No. 675,536
Int. Cl.[4] G01N *11/12*
U.S. Cl. 73—57 **23 Claims**

1. A viscometer comprising:
A. a bobbin including ferromagnetic material;
B. guide means for guiding the bobbin between first and second positions through a fluid whose viscosity is to be measured;
C. bobbin-driving means for driving the bobbin from the first position to the second position with a predetermined force;
D. first and second coils disposed adjacent the guide means and oriented with respect thereto so that the mutual inductance between the first and second coils changes as a function of bobbin position; and
E. means for monitoring the mutual inductance, measuring the time from the time at which the bobbin leaves the first position to the time at which the monitored inductance reaches the point in its position function that corresponds



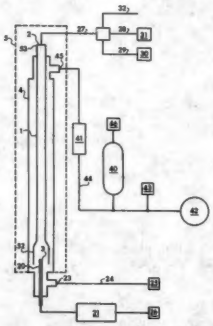
to the second position, and generating an indication of that time measurement, thereby indicating the viscosity of the fluid.

4,627,273

APPARATUS AND METHOD FOR DETERMINING THE MINIMUM MISCIBILITY PRESSURE OF A GAS IN A LIQUID

Richard L. Christiansen, and Hiemi Kim, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Aug. 28, 1985, Ser. No. 770,819
Int. Cl.[4] G01N *7/00*
U.S. Cl. 73—61.1 R **30 Claims**



1. An apparatus for measuring the minimum miscibility pressure of a gas in a liquid comprising:
a substantially enclosed transparent pressure vessel;
a transparent tube having an open bottom and a closed top;
said tube mounted such that said pressure vessel substantially encloses said tube in a substantially constant pressure environment and the interior of said tube directly fluid communicates with the interior of said vessel essentially only via said open bottom;
a liquid feed means connected to said tube substantially above said open bottom for placing said liquid directly into said tube;
a bubble injection means directed into said open bottom of said tube for injecting a bubble formed from said gas into said tube via said open bottom;
a gas discharge means connected to said tube substantially above said open bottom and said bubble injection means for discharging said bubble from said tube; and
a pressure maintenance means in fluid communication with said vessel and said tube for maintaining said substantially constant pressure environment in said vessel and tube by automatically responding to the injection of said bubble into said tube.

4,627,274

APPARATUS FOR TESTING STABILITY OF HEAVY OIL

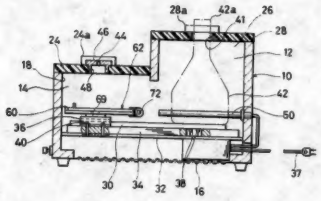
Takao Nagasawa, Kawasaki, and Satoru Uchida, Matsudo, both of Japan, assignors to Nippon Oil Company, Limited, Japan

Filed Jun. 21, 1985, Ser. No. 749,471

Claims priority, application Japan, Jun. 27, 1984, 59-95266; Jun. 3, 1985, 60-82518

Int. Cl.[4] G01N *33/28*

U.S. Cl. 73—64 20 Claims



1. An apparatus for testing the stability of heavy oil, which comprises one case body within which a sample heating tank and an air bath tank, communicating with each other, are arranged in the lateral direction, at least one electric heating means arranged horizontally in the bottom portion of the case body, a temperature detecting element for detecting the temperature of air in said air bath tank, temperature control means for controlling the quantity of an electric current supplied to said heating means based on the detection value of said temperature detecting element so that the air temperature in said air bath tank is maintained at a predetermined level, a filter paper arranged in said air bath tank, on which a sample is dropped, filter paper holding means for maintaining said filter paper at a predetermined height in said air bath tank, a first cover covering the top face of said simple heating tank of said case body and having an opening in which the open top end portion of a sample vessel arranged in said heating tank is inserted, and a second cover covering the top face of said air bath tank of said case body and having a sample dropping opening, wherein a heavy oil sample heated in the sample vessel is dropped on the filter paper and the stability of heavy oil is determined based on the state of the spreaded heavy oil sample on the filter paper.

4,627,275

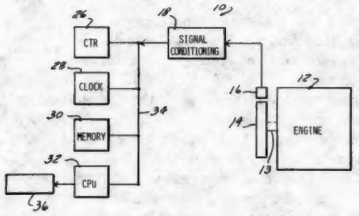
ENGINE DEFICIENCY INDICATOR

Naeim A. Henein, Grosse Pointe Shores, and Arun K. Sood, Southfield, both of Mich., assignors to Wayne State University, Detroit, Mich.

Filed May 7, 1984, Ser. No. 607,570

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—112 14 Claims



1. An apparatus for indicating deficient engine operation comprising:

means for continuously detecting a pre-determined amount of angular rotation of a rotatable component of an engine;

means, responsive to the detecting means, for continuously determining the time period of each pre-determined amount of engine rotation;

processing means, responsive to the determining means, for continuously generating a manifestation of engine efficiency and deficiency based on each time period; and

display means, responsive to the processing means, for continuously indicating the efficiency or deficiency of engine operation.

4,627,276

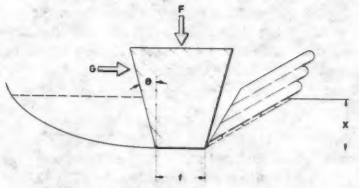
METHOD FOR MEASURING BIT WEAR DURING DRILLING

Trevor M. Burgess, and William G. Lesso, Jr., both of Missouri, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 27, 1984, Ser. No. 686,851

Int. Cl.[4] E21B *12/00*

U.S. Cl. 73—151 4 Claims



THE ACTION OF A SINGLE BLUNT TOOTH.

1. A method of monitoring the wear of the teeth of milled tooth bits while drilling in formations that drill by a gouging and a scraping action comprising the steps of

measuring the weight on the bit, the torque required to rotate the bit, and the speed of rotation of the bit;

calculating the rate of penetration R in distance drilled per unit of time;

calculating the dimensionless torque T_D from the equation, $T_D=M/Wd$, where M is the measured torque, W is the weight on the bit, and d is the bit diameter using appropriate dimensions to produce a dimensionless T_D;

calculating the dimensionless rate of penetration R_D from the equation, $R_D=R/Nd$, where R is the rate of penetration, N is the rate of rotation of the drill pipe, and d is the diameter of the bit, using appropriate dimensions to produce a dimensionless R_D;

empirically determining the values of constants a_1 and a_2 for a sharp drill bit by plotting T_D vs R_D from data collected for a sharp drill bit, with a_1 being the intercept of the T_D axis and a_2 being the slope of the line through the plotted points; and

determining bit efficiency from the equation $E_D=(T_D-a_2 R_D)/a_1$; and

pulling the bit when the bit efficiency drops to a preselected amount.

4,627,277

MAGNET SELECTOR OR SWITCH

John S. Baer, Bar Harbor, Me., assignor to RainWise, Inc., Bar Harbor, Me.

Filed May 17, 1985, Ser. No. 735,372

Int. Cl.[4] G01W *1/04;* H01H *36/00*

U.S. Cl. 73—170 R 19 Claims

1. A magnet switch for switching an electronic circuit device in a housing comprising:

at least one reed switch incorporated in said electronic circuit device in proximity to a horizontal surface of the housing;

an elongate sliding groove or sliding channel formed in said horizontal surface of the housing above the reed switch, said sliding channel having a cross sectional profile open

at the top; and a magnet element removable and replaceable in the sliding channel through the open top of the sliding channel, said magnet element being seated in the sliding channel for sliding motion back and forth along the sliding channel, said magnet element being magnetized

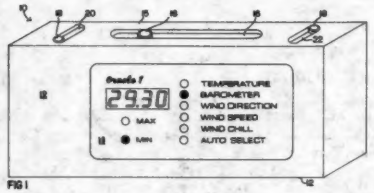


FIG 1

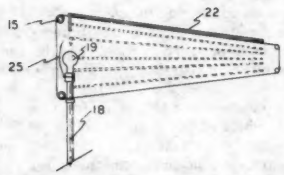
with magnetic lines of force extending into the housing below the magnet element when the magnet element is seated in the sliding channel for magnetic actuation of the reed switch according to the position of the magnet element in the sliding channel.

4,627,278

ILLUMINATED WIND SOCK

Henry L. Soto, 2030 Mission St., San Francisco, Calif. 94110

Filed Apr. 25, 1985, Ser. No. 727,321
Int. Cl.[4] G01W *1/00*
U.S. Cl. 73—188 **3 Claims**



1. An illuminated wind sock apparatus wherein the apparatus comprises:

a wind sock unit including an elongated tapered tubular sock member mounted on a framework member which is rotatably disposed on a pole member;

an illumination unit comprising at least one source of illumination disposed within the interior of the said tubular sock member; and

a fiber optic unit comprising a plurality of fiber optic members disposed on the exterior of the tubular sock member and having one end exposed to the light emanating from said at least one source of illumination.

4,627,279

DIRECT-HEATED GAS-FLOW MEASURING APPARATUS

Minoru Ohta, Okazaki; Kazuhiko Miura, Aichi; Seizi Huzino, Anjo; Kenji Kanehara, Aichi, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

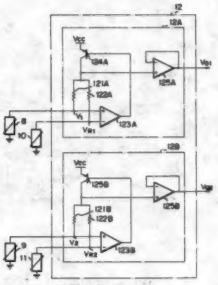
Filed May 2, 1985, Ser. No. 729,855
Claims priority, application Japan, May 9, 1984, 59-91042
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—195 **13 Claims**

1. A direct-heated gas-flow measuring apparatus for measuring the gas-flow rate within a passage, comprising:

two parallel supporting members disposed within said passage;

a plurality of film resistors for generating heat and detecting the temperature thereof, said film resistors extending between said supporting members to expose both surfaces of each of said film resistors to the gas-flow;

feedback control means, connected to said film resistors, for controlling the heat generated by each of said film resistors so that the temperature of each of said film resistors is a predetermined value, said feedback control means generating a plurality of output signals corresponding to voltages applied to said film resistors; and



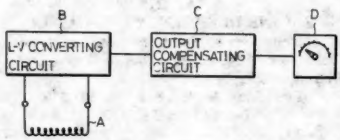
calculating means, connected to said feedback control means, for calculating a mean value of said plurality of output signal generated by said feedback control means, the mean value indicating the amount of gas-flow rate.

4,627,280

INDUCTANCE LIQUID LEVEL METER

Chikahisa Hayashi; Makoto Kawai, and Mikio Adachi, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed May 30, 1985, Ser. No. 739,476
Claims priority, application Japan, May 31, 1984, 59-112277; May 31, 1984, 59-112278; May 31, 1984, 59-112279; May 31, 1984, 59-112280; May 31, 1984, 59-81247[U]; May 31, 1984, 59-81248[U]; May 31, 1984, 59-81249[U]
Int. Cl.[4] G01F *23/76*; G01R *33/00*
U.S. Cl. 73—290 R **17 Claims**



1. A liquid level meter comprising:

(a) a core, and a coil wrapped therearound, the coil having an external circumference and extending in a longitudinal direction,

(b) a float which is provided at the external circumference of the coil so that it can move in the longitudinal direction thereof along the core and which has a conductor ring located around an inner circumference thereof so that the conductor ring is adjacent to different longitudinal areas of the coil depending on the fluid level,

(c) detector means for detecting a change of inductance of the coil caused by eddy current loss within the coil when the conductor ring is adjacent to different longitudinal areas of the coil,

(d) converting means for converting the change of inductance detected by the detector means into a change of voltage, and

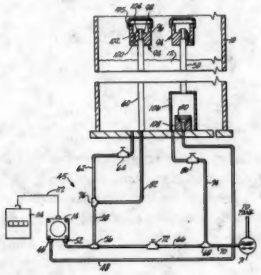
(e) an indicator of liquid level which is driven by a drive circuit based on a voltage of the converting means.

4,627,281

TANK GAGING SYSTEM

John A. Tavis, Mariposa, Calif., assignor to Tavis Corporation, Mariposa, Calif.

Filed May 10, 1985, Ser. No. 732,686
Int. Cl.[4] G01F *23/16, 23/18*
U.S. Cl. 73—302 **8 Claims**



1. An apparatus for measuring the level of a liquid in a tank, comprising:

a differential pressure transducer;

a first standpipe adapted to be filled with the liquid to a high level reference height in a first mode and to be placed in fluid communication with the liquid in the tank such that the liquid level in the standpipe will be the same as that in the tank in a second mode;

a second standpipe adapted to be filled with the liquid to the high level reference height in a first mode and to be drained of the liquid to a low level reference height in a second mode;

means allowing the transducer to compare, at different selected times, the pressure exerted by the liquid in the first standpipe in the first mode with the pressure exerted by the liquid in the second standpipe in the first mode for zero-drift check, the pressure exerted by the liquid in the first standpipe in the first mode with the pressure exerted by the liquid in the second standpipe in the second mode for sensitivity drift check, and the pressure exerted by the liquid in the first standpipe in the second mode with the pressure exerted by the liquid in the second standpipe in the second mode for measuring an output representative of the liquid level in the tank; and

means for selectively filling and draining the standpipes to achieve the several modes.

4,627,282

FLUID LEVEL SENSOR

Douglas I. Fales, Burton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1985, Ser. No. 809,228
Int. Cl.[4] G01F *23/16*
U.S. Cl. 73—302 **2 Claims**

1. An apparatus for indicating the level of fluid in a tank, the apparatus comprising, in combination:

a casing disposed at the bottom of the tank and having opposed surfaces;

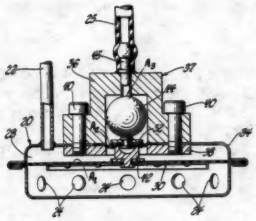
first and second diaphragms carried by the opposed surfaces of the casing, the casing and the first and second diaphragms forming an atmospheric chamber isolated from the fluid, the external surfaces of the chamber being exposed to the fluid pressure at the bottom of the tank, the fluid exerting a force equal to A_1*P_f on the first diaphragm and an opposing force A_2*P_f on the second diaphragm, where A_1 is the area of the first diaphragm, A_2 is the area of the second diaphragm and P_f is the fluid pressure per unit area at the bottom of the tank and which is proportional to the level of the fluid in the tank;

a valve including a moveable valve member and a valve seat having an area A_3;

means for transmitting the net force $P_f(A_1-A_2)$ exerted by the fluid on the first and second diaphragms to the valve member in a sense tending to seat the valve member against the valve seat;

an output pressure line coupled between the pressure gage and the valve seat, the output pressure line being vented to the tank when the valve member is unseated from the valve seat;

a fluid pump for pumping fluid under pressure from the tank;



a fluid flow restrictor;

means for coupling the liquid under pressure to the output pressure line through the fluid flow restrictor to pressurize the output pressure line, the fluid pressure in the output pressure line generating a force equal to P_g*A_3 on the valve member tending to unseat the valve member from the valve seat, where P_g is equal to the pressure per unit area of the fluid in the output pressure line, the valve member being moved by the forces acting thereon to modulate the pressure P_g in the output pressure line to a value substantially equal to $P_f(A_1-A_2)/A_3$; and

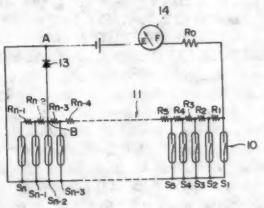
a pressure gage responsive to the fluid pressure in the output pressure line for providing a measure of the fluid level in the tank.

4,627,283

FUEL LEVEL DETECTOR FOR AUTOMOBILE FUEL TANK

Katsuhiko Nishida, Toyota; Tokio Naruse, and Hiroshi Shibata, both of Chiryu, all of Japan, assignors to Tsuchiya Co., Ltd., Nagoya, Japan

Filed Oct. 28, 1985, Ser. No. 791,711
Claims priority, application Japan, Aug. 13, 1985, 60-123589[U]
Int. Cl.[4] G01F *23/62;* H01H *35/18*
U.S. Cl. 73—313 **4 Claims**



1. A fuel level dectector for an automobile fuel tank comprising a struct vertically provided with the fuel tank, a float slidably fitted around the strut and having a permanent magnet therein, a plurality of magnetic induction type reed switches

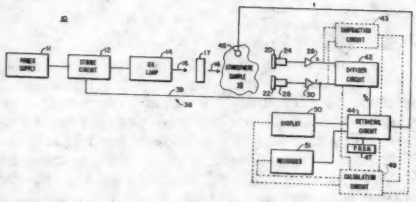
disposed along the strut and inclined relative thereto, the distance between the adjacent switches being such that the permanent magnet of said float always actuates two adjacent reed switches simultaneously, a plurality of resistances each respectively connected to said plurality of reed switches for changing current value according to said reed switches which are actuated, a residual quantity warning means comprising a light emitting body connected between a ground and a predetermined reed switch and the respective resistance among the plurality of reed switches for changing the brightness thereof as said float falls below said predetermined reed switch, and a distance retention mechanism for keeping constant a distance between said predetermined reed switch and the bottom surface of the fuel tank, said mechanism comprising a guide mounted to a base member for vertically guiding the strut and a spring mounted between the base member and the strut for urging the strut towards the bottom surface of the fuel tank.

4,627,284

ULTRAVIOLET ABSORPTION HYGROMETER

Michael E. Gersh, Bedford; Fritz Bien, Concord, and Lawrence S. Bernstein, Bedford, all of Mass., assignors to Spectral Sciences, Inc., Burlington, Mass.

Filed Jul. 22, 1985, Ser. No. 757,165
Int. Cl.[4] G01W *1/00*
U.S. Cl. 73—336.5 **31 Claims**



1. An ultraviolet absorption hygrometer comprising:

a source of pulsed ultraviolet radiation for providing in each pulse radiation both in a first wavelength region where water absorbs significantly, and in a second proximate wavelength region where water absorbs weakly;

means for detecting ultraviolet radiation respectively in said first and second regions transmitted through a single sample path of gas;

means, responsive to said means for detecting, for comparing the intensity of the radiation transmitted in each of the first and second regions; and

means, responsive to said means for comparing, for determining the amount of water in the sample path.

4,627,285

POINTER FOR LIQUID FILLED GAUGES

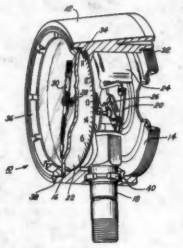
Edwin H. King, P.O. Box 67, Newburgh, Ind. 47630

Filed Apr. 2, 1985, Ser. No. 718,892
Int. Cl.[4] G01D *11/10*
U.S. Cl. 73—430 **2 Claims**

1. An improved construction for measuring the temperature or pressure of a fluid filled gauge, comprising, in combination:

a gauge enclosure, the enclosure being attached to a fluid source to be measured and filled with a damping liquid;

a unitary pointer constructed from a single strip of material, the pointer indicating by its rotation the temperature or the pressure of the measured fluid and being configured to resist rotational motion of the pointer by increasing the drag on the pointer against the liquid filling the enclosure during the gauge operation and resulting pointer movement, the pointer having at least one generally flat surface positioned approximately perpendicular to the pointer's plane of rotation, with at least one segment of the pointer's flat surface being twisted to be perpendicular to the pointer's axis of rotation to form the generally flat and approximately perpendicular surface, whereby increased drag on the pointer against the damping liquid results during pointer rotation; and



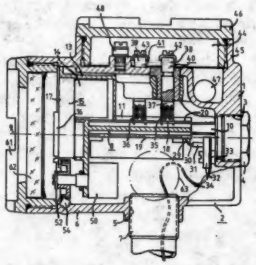
a mechanism adapted to rotate the pointer in response to temperature or pressure changes in the fluid source to be measured, whereby pointer fluctuation is dampened and resulting damage and wear to the mechanism from vibration related stress is reduced.

4,627,286

PRESSURE OR PRESSURE DIFFERENCE MEASURING INSTRUMENT

Horst Pehlgrim, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,229
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 8407656[U]
Int. Cl.[4] G01L *19/14*
U.S. Cl. 73—431 **11 Claims**



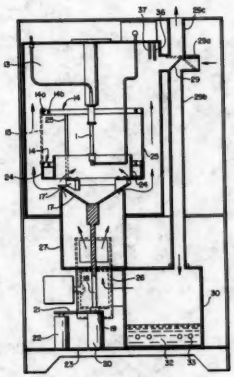
1. A pressure or pressure difference measuring instrument having a pot-like housing in which is accommodated at least one electronic circuit part and having an opening in one end of the pot-like housing for fastening a sensor for the detection of the pressure or pressure difference, the at least one electronic circuit part comprising a planar subassembly and being insertable into the pot-like housing by guide means disposed along the inside wall of the housing, the guide means extending in a plane parallel to the longitudinal axis of the instrument, the pot-like housing having at least one other opening to fasten the sensor in a wall thereof in an area below the planar subassembly.

4,627,287

LIGHT-RESISTANCE TESTER FOR MAINTAINING UNIFORM TEMPERATURE AT SURFACE OF SAMPLE

Shigeru Suga, 20-2, Yoyogi 5-chome, Shibuya-ku, Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 746,845
Claims priority, application Japan, Oct. 20, 1984, 59-226766
Int. Cl.[4] G01N *17/00*
U.S. Cl. 73—865.6 5 Claims



1. A light resistance tester for maintaining a uniform temperature of the surface of a sample being tested, comprising:

a testing chamber;

a light source mounted in the center of said testing chamber;

an annular sample mounting frame positioned around said light source and rotatable around said light source as the center of rotation;

air circulation means mounted in the lower portion of said testing chamber below said sample mounting frame and circulating air upwardly in said testing chamber toward said sample mounting frame; and

an air flow divider between said sample mounting frame and said light source for dividing the upward flow of air from said air circulation means into a portion flowing in an upward path within said sample mounting frame and spaced inwardly from samples mounted on said frame and around said light source, and a portion flowing along an upward path along the outside of said sample mounting frame.

4,627,288

BEARING UNLOADING MECHANISM FOR DISC CLAMPING UNIT

Nahum Guzik, Mountain View; John L. Guerini, San Jose, and Semyon Sherstinsky, San Francisco, all of Calif., assignors to Guzik Technical Enterprises, Sunnyvale, Calif.

Filed Aug. 12, 1985, Ser. No. 764,413
Int. Cl.[4] G01M *1/19*
U.S. Cl. 73—432.1 13 Claims

1. A bearing unloading mechanism for a disc clamping unit, comprising:

stationary casing means;

hollow spindle means rotatably mounted in said stationary casing means;

disc support means mounted on said spindle means;

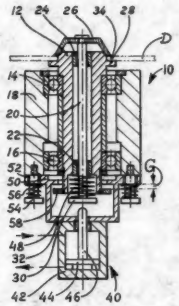
a disc clamping element;

a longitudinal element slidingly arranged in said hollow spindle means and attached to said disc clamping element;

first resilient means mounted between said hollow spindle means and said longitudinal element, said first resilient means normally urging said first resilient means in a direction which urges said attached disc clamping element to said disc support means;

moveable casing means;

an actuator rigidly attached to said moveable casing means, said actuator having a working element positioned to engage said longitudinal element so that when said actuator is in an actuated position, it overcomes the force of said first resilient means and releases said disc clamping element from said support means; and



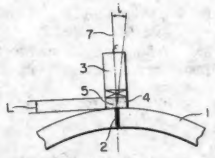
moveable connection means moveably connecting said stationary casing means to said moveable casing means so that when said actuator is in an actuated position, a floating system is formed of said actuator, said moveable casing means, said longitudinal element, said hollow spindle means, said disc support means, said disc clamp element, and said first resilient means.

4,627,289

METHOD FOR THE ULTRASONIC FLAW DETECTION OF AN ELECTRIC WELDED PIPE

Shinichi Fukuda; Masaki Kajiyama, and Takeshi Ikemoto, all of Hikari City, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,425
Claims priority, application Japan, Nov. 6, 1984, 59-232491
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—622 3 Claims



1. A method for ultrasonic flaw detection of flaws in the weld zone of an electric resistance welded pipe, comprising:

projecting an ultrasonic wave beam having a frequency in the range of 25 MHz to 500 MHz onto the outer surface of said weld zone at an angle of incidence to a perpendicular to the tangent to said pipe at the weld zone, which angle is between 0° and 12°,

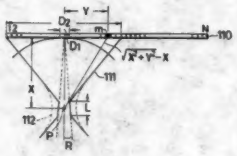
whereby cold weld defects, inclusions and penetrators in the weld zone are detected.

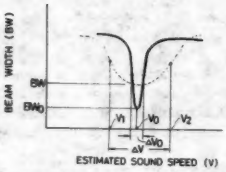
4,627,290

METHOD AND APPARATUS FOR DETECTING ACOUSTIC HOMOGENEITY OF OBJECT

Toshio Ogawa, Nishitama; Kageyoshi Katakura, Meguro, and Shinichiro Umemura, Hachioji, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Apr. 15, 1985, Ser. No. 723,157
Claims priority, application Japan, Apr. 13, 1984, 59-72838
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—628 **4 Claims**





1. A method of detecting the acoustic homogeneity of an object, comprising:

transmitting a pulsating sound wave beam into an object using an array-type transducer which consists of a plurality of elements, and receiving the reflected waves using said transducer while electronically focusing the reflected waves, the sound waves being transmitted and reflected repeatedly;

adjusting the degree of electronic focusing at the time of repetitively transmitting and receiving the sound wave beam so that the focal point of the receive wave beam is made coincident with a specified reflector in said object;

detecting the beam width of the sound wave beam at the specified reflector from the detector signals produced by said transducer after the focal point has been made to coincide with said reflector; and

utilizing said detected beam width as an index to represent the acoustical homogeneity of said object.

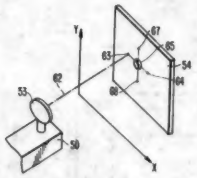
4,627,291

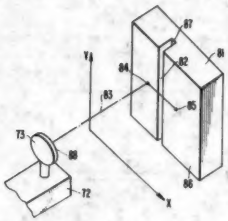
POSITION SENSING APPARATUS FOR AN OBJECT TO BE MEASURED

Toshinori Otsuki, Yawata, and Teruo Maruyama, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP84/00287, § 371 Date Feb. 1, 1985, § 102(e) Date Feb. 1, 1985, PCT Pub. No. WO84/04961, PCT Pub. Date Dec. 20, 1984
PCT Filed Jun. 5, 1984, Ser. No. 705,470
Claims priority, application Japan, Jun. 6, 1983, 58-101113; Jun. 24, 1983, 58-114527; Nov. 8, 1983, 58-210210
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—634 **4 Claims**

1. A position sensing apparatus for an object to be measured which comprises: a first means including an ultrasonic wave transmit-receive element for transmitting an ultrasonic wave to the object to be measured and for receiving a reflected wave therefrom; a second means for maintaining said ultrasonic wave transmit-receive element at a predetermined distance from said object and for effecting a linear movement of said element with respect to said object, said element having a wave transmit-receive surface which is inclined at a predetermined angle of inclination with respect to a measured surface





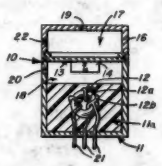
of said object; and a third means for detecting a center position of a bore or groove formed in said measured surface of said object by utilizing a change in intensity of a signal corresponding to said reflected wave from said measured surface.

4,627,292

AC TRANSDUCERS, METHODS AND SYSTEMS

Stephen A. Dekrone, Chesapeake, Va., assignor to Randek Inc., Richmond, Va.

Filed Jul. 3, 1984, Ser. No. 627,667
Int. Cl.[4] G01L *7/08, 9/10*
U.S. Cl. 73—728 **40 Claims**



1. A pressure transducing device comprising a movable wall to receive at least one variable applied pressure to be measured, and movable in response thereto, magnet means associated with said movable wall for movement therewith, and a toroidal inductor adjacent thereto, the position of said magnet means being generally radial of said toroidal inductor and being directly related to the applied pressure, said toroidal inductor comprising a toroidal core upon which is wound coil means of suitable inductance, said coil means being configured to allow sinusoidal excitation of a portion thereof from an external source and formed as a transformer, wherein an applied pressure will cause said magnet to continuously variably coerce the magnetic flux contained within the aforementioned toroidal core to effect a measurement of the variable pressure, the variation in such coercion being dependent upon the radial separation of said magnet means and said toroidal core thereby

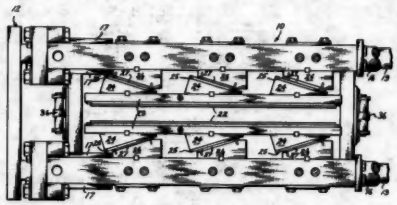
continuously varying the toroidal inductor output amplitude from a second portion of said coil means when said first coil portion is excited.

4,627,293

APPARATUS FOR TENSION TESTING OF LUMBER

Friend K. Bechtel, Moscow, Id., assignor to Metriguard, Inc., Pullman, Wash.

Filed Oct. 3, 1985, Ser. No. 783,469
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—831 **2 Claims**



1. An apparatus for longitudinal strength testing of lumber, comprising:

grip plate means for engaging opposite surfaces of a board at two longitudinally spaced locations along its length;

force means operably connected to the grip plate means for selectively applying a progressively increasing longitudinal tensile force to the board engaged thereby in a direction parallel to its engaged surfaces;

wedge means interposed between said force means and said grip plate means for applying a transverse clamping force to the grip plates that varies as a function of the tensile force applied to the board engaged by said grip plate means;

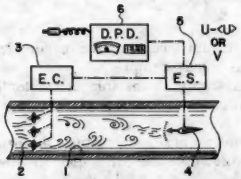
said wedge means includes an inclined bearing surface area of polytetrafluoroethylene sliding against steel arranged at a wedge angle relative to the engaged surfaces of the board between relatively movable elements operably connected to said force means and to said grip plate means respectively, said inclined bearing surface area having a coefficient of friction that progressively decreases with increasing load in a direction normal to the inclined bearing surface area as tensile force is applied to the board engaged by said grip plate means, to progressively increase the ratio of the clamping force to the tensile force in a non-linear manner at a decreasing rate as the tensile force applied to the board is increased.

4,627,294

PULSED EDDY FLOW METER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Aug. 12, 1985, Ser. No. 764,890
Int. Cl.[4] G01F *1/72*
U.S. Cl. 73—861.05 **14 Claims**



1. A pulsed eddy flow meter comprising in combination:

(a) a flow passage;

(b) an eddy generating means disposed within said flow passage at one section of said flow passage wherein the generation of eddies in fluid medium flowing across said one section of said flow passage is enhanced when said eddy generating means is in an activated state and the generation of eddies in fluid medium flowing across said one section of said flow passage is suppressed when said eddy generating means is in a deactivated state;

(c) an eddy sensing means disposed within said flow passage at another section of said flow passage downstream from said one section;

(d) a transducer converting mechanical effect of eddies on said eddy sensing means to an electric signal;

(e) a controller receiving said electrical signal from said transducer, said controller imposing one state out of said activated state and said deactivated state on said eddy generating means wherein said controller automatically imposes said activated state following a deactivated state of a predetermined duration and imposes said deactivated state at an instant when said eddy sensing means detects an eddy of an intensity greater than a thresh-hold intensity, which thresh-hold intensity is greater than the intensity of eddies generated by said eddy generating means at said deactivated state and is less that the intensity of eddies generated by said eddy generating means at said activated state; and

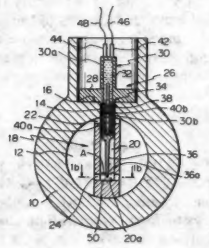
(f) means for obtaining a representative fluid velocity by dividing the distance between said eddy generating means and said eddy sensing means by the duration of the imposition of the most recent activated state.

4,627,295

VORTEX FLOW METER

Naoki Matsubara; Hideo Numata, and Yutaka Ogawa, all of Tokyo, Japan, assignors to Oval Engineering Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 554,155, Nov. 15, 1983, abandoned.
This application Jan. 21, 1986, Ser. No. 821,222
Claims priority, application Japan, Nov. 25, 1982, 57-206800; Nov. 25, 1982, 57-206801; Jul. 26, 1983, 58-116935[U]; Jul. 26, 1983, 58-116936[U]; Jul. 26, 1983, 58-116937[U]; Sep. 22, 1983, 58-146888[U]
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.24 **18 Claims**



1. A vortex flow meter for measuring the flow rate of a fluid flowing through an internal space of a conduit by sensing the pressure variation which occurs in proportion to the flow rate, said vortex flow meter comprising, in combination:

(a) a bluff body disposed in the internal space of the conduit to face the flow of the fluid and having a pressure sensing chamber defined in an internal space of said bluff body for sensing the pressure variation due to vortices generated by the flow of the fluid, said pressure sensing chamber having an upper pressure induction passageway and a lower pressure induction passageway;

(b) a pressure receiving member disposed in the internal

space of said bluff body to mechanically oscillate or displace in response to the pressure variation, said pressure receiving member comprising a flat pressure receiving plate which protrudes into the pressure sensing chamber to bisect the chamber;

(c) a cylindrical member mounted in and extending through a wall portion of the conduit and connected to the pressure receiving member at a lower end of the cylindrical member, said cylindrical member having an internal space; and

(d) a pressure sensor member disposed in said internal space of said cylindrical member such as to prevent said pressure sensor member from being contacted by the fluid flow in said conduit, said pressure sensor member having imparted thereto the mechanical displacement of said pressure receiving plate to thereby measure the flow rate in said conduit, said pressure sensor member comprising a resilient substrate, a converter element for converting the mechanical displacement of said pressure receiving plate due to the vortices to an electrical signal, said converter element being bonded to at least one of opposite surfaces of said substrate, and an electrically insulative filling agent for fixing said substrate and converter element in the internal space of said cylindrical member.

17. A vortex flow meter for measuring a flow rate of a fluid flowing through an internal space of a conduit by sensing a pressure variation which occurs in proportion to the flow rate, said vortex flow meter comprising:

(a) a bluff body disposed in the internal space of the conduit to face the flow of the fluid and having a pressure sensing chamber defined in an internal space thereof, said pressure sensing chamber having an upper pressure induction passageway and a lower pressure induction passageway;

(b) a pressure receiving member disposed in the internal space of said bluff body to be displaceable in response to the variation;

(c) a drain port in the pressure sensing chamber in a position lower than the lower pressure induction passageway and lower than a free end of the pressure receiving member, whereby part of the fluid tending to deposit on a bottom wall of the pressure sensing chamber is discharged;

(d) a wall rising from a central portion of the bottom wall of the pressure sensing chamber to regulate a clearance which is defined between the pressure receiving member and the bottom wall;

(e) a sensor member arranged to be positioned in a wall portion of the conduit and outwardly thereof; and

(f) a cylindrical member mounted in the wall portion of the conduit and connected to the pressure receiving member at a lower end thereof, said cylindrical member accommodating the sensor member fixed in place in an internal space thereof.

4,627,296

SHUNT CALIBRATION SYSTEM FOR A TRANSDUCER MOUNTED ON A ROTATING MEMBER

Paul W. Morgan, Pontiac, and Kish Amlani, Troy, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 431,066
Int. Cl.[4] G01L *3/02*
U.S. Cl. 73—862.33 **8 Claims**

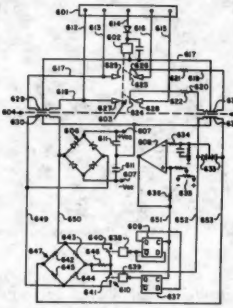
1. In a transducer system including a rotatable shaft, a transducer mounted on said rotatable shaft, a rotary transformer means including a rotor member operatively associated with said rotatable shaft for rotation therewith and a stationary stator member, said rotary transformer means coupling a transducer output signal between said rotor member and said stator member without physical contact, the improvement of a selectively operable shunt calibration system comprising:

a. impedance means secured to said rotatable shaft for rotation therewith,

b. switch means mounted on said rotatable shaft for rotation therewith, said switch means operable for coupling said impedance means across at least a first part of said transducer,

c. means for generating first and second encoded signals and transmitting the first and second encoded signals from the stator member to the rotor member through said rotary transformer means to control the actuation of the switch means, and

d. switch actuating means mounted on said rotor member for operating said switch means and said switch actuating



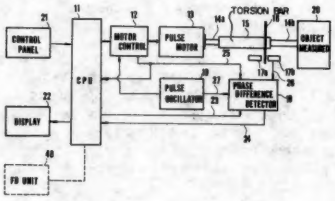
means being connected to receive the first and second encoded signals and said transducer output signal, said first and second encoded signals being distinguished from said transducer output signal by amplitude, said switch actuating means causing said switch means to couple and decouple said impedance means to at least said first part of said transducer in accordance with the first and second encoded signals, said first and second encoded signals being pulse encoded and being distinguished from one another by time sequence.

4,627,297

APPARATUS FOR MEASURING THE MAGNITUDE OF A LOAD

Shigeyuki Akimoto, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Jul. 12, 1985, Ser. No. 754,148
Claims priority, application Japan, Jul. 12, 1984, 59-143217
Int. Cl.[4] G01L *3/12*
U.S. Cl. 73—862.34 **6 Claims**



1. An apparatus for measuring the magnitude of a load connected to a drive shaft, comprising:

drive shaft rotating means for intermittently driving the drive shaft into rotation in response to a drive signal of a changing level;

drive transmission means connecting the drive shaft to the load and rotated by the drive shaft for transmitting rotation of the drive shaft to the load;

displacement means provided in a section of said drive transmission means for being rotatively displaced by the load by an amount corresponding to the magnitude of the load;

sensing means for sensing the rotational position of said displacement means on a side thereof at which said transmission means is connected to the load, and for producing an output signal indicative of said rotational position;

phase difference detecting means for detecting a phase difference between the output signal of said sensing means and the drive signal; and

calculating means for calculating the magnitude of the load based on the phase difference detected by said phase difference detecting means.

4,627,298

TORQUE SENSOR OF THE NONCONTACT TYPE

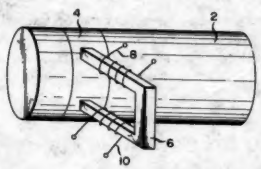
Masashi Sahashi, Fujisawa; Koichiro Inomata, and Tadahiko Kobayashi, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 24, 1984, Ser. No. 643,703

Claims priority, application Japan, Aug. 30, 1983, 58-158717; Sep. 17, 1983, 58-164857; Dec. 8, 1983, 58-230680

Int. Cl.⁴ G01L *3/10*

U.S. Cl. 73—862.36 **10 Claims**



1. A torque sensor of a noncontact type for sensing a rotary torque applied to a shaft, comprising:

a first film shaped magnetic ribbon bonded to the shaft along the circumferential direction of the shaft, said ribbon comprising a magnetic material having a previously induced magnetic anisotropy in a direction of an angle θ to the circumferential direction of the shaft;

a first core member formed of a magnetic material and having end faces opposite to said ribbon bonded to said shaft;

a first exciting coil wound around said first core member for producing a magnetic flux; and

a first detecting coil wound around said first magnetic core member for detecting a magnetic flux produced by the first exciting coil and introduced to the core member through said ribbon along the circumferential direction of the shaft and generating an output signal.

4,627,299

ENGINE STARTER GEARING

Harold R. Mortensen, Sr., Murfreesboro, N.C., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Dec. 20, 1984, Ser. No. 684,663

Int. Cl.⁴ F02N *15/06*

U.S. Cl. 74—7 A **15 Claims**

1. An engine starter for engagement with a starting gear of an engine to be started, said engine starter comprising:

a power shaft;

a pinion gear mounted to said power shaft for axial and rotatable movement relative thereto, said pinion gear further being engageable with said starting gear;

clutch means slidably mounted to said power shaft, said clutch means further comprising:

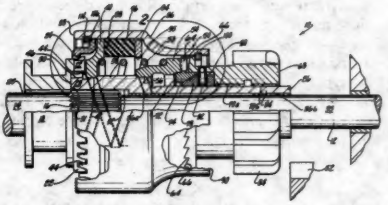
a primary clutch;

a secondary clutch mounted adjacent said primary clutch to communicate therewith;

said secondary clutch comprising a secondary driving member mounted to said shaft and a secondary driven member mounted concentric to said secondary driving member and communicating with said primary clutch;

said primary clutch comprising a primary driving member and a primary driven member mounted adjacent said primary driving member for communication therewith, said primary driven member further being connected with said pinion gear such that rotational force from said power shaft is translated to said pinion gear by said primary and secondary clutch;

means for resiliently biasing said secondary clutch closed to translate rotational force from said power shaft to



said primary clutch for rotating said starting gear of the engine to be started, said resilient biasing means adapted to permit said secondary clutch to slip when torsional force is imposed by said engine to said power shaft; and

means for separating said primary clutch when said pinion gear is driven by said starting gear of the engine to be started at a predetermined speed of rotation faster than the speed of said power shaft.

4,627,300

POSITIONING ACTUATOR FOR SIX-HIGH ROLL STAND

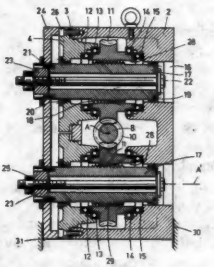
Erich Stoy, Ratingen, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,402

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1983, 3335858

Int. Cl.⁴ F16H *19/00, 25/20*

U.S. Cl. 74—89.15 **9 Claims**



1. A positioning actuator for location within a window of a roll-stand frame between a pair of working-roll journal blocks and wall of the window of the roll-stand frame so as to shift the working rolls horizontally in a lateral direction of strip travel, the actuator comprising:

a housing of a size to fit in said window between said wall and said journal blocks;

a worm shaft rotatable in the housing about a main axis and formed with two axially offset worms;

respective pairs of worm wheels flanking and meshing with the worms, the wheels being rotatable in the housing about respective parallel axes lying in planes parallel to, flanking, and offset from the main axis, the worm wheels

each being formed internally centered on the respective axis with a screwthread;

respective pusher rods extending along the worm-wheel axes through the worm wheels and each formed with an external screwthread complementary to and meshing with the respective internal screwthread;

means engaging the rods and housing for inhibiting rotation of the rods about the respective worm-wheel axes while permitting movement of the rods along the respective worm-wheel axes, the screwthreads being of such hand that rotation of the worm shaft in one direction about the main axis moves the rods synchronously along the respective worm-wheel axes in one direction while opposite worm-shaft rotation moves the pusher rods axially oppositely; and

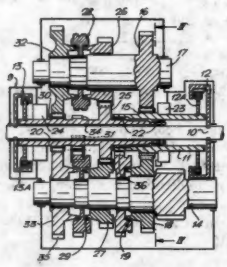
two respective axial-thrust bearings and two respective radial-thrust bearings supporting each of the worm wheels in the housing.

4,627,301

CHANGE SPEED TRANSMISSION

Wilfred N. Bainbridge, Banbury, and Alastair J. Young, Kenilworth, both of United Kingdom, assignors to Automotive Products plc, Leamington Spa, England

Filed Mar. 18, 1985, Ser. No. 713,284
Int. Cl.[4] F16H *3/08*
U.S. Cl. 74—333 **11 Claims**



1. a change speed transmission including gear trains which provide increasing speed ratios and two clutches which are independently operable and provide alternative drive paths through the gear trains between an input and an output, the gear trains providing alternate ratios driven respectively through one and the other clutch said input comprising a first shaft rotatably fast with a driven member of one clutch and a second shaft rotatably fast with a driven member of the other clutch, a layshaft being provided through which drive in a selected ratio is transmitted from one of the first and second shafts to the other of the first and second shafts to drive the output, one of the first and second shafts having a gear thereon which meshes with a gear on the output.

4,627,302

COUNTERSHAFT TRANSMISSION

Rick A. Laylock, Washington, and Michael R. Theobald, Princeville, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 26, 1985, Ser. No. 780,140
Int. Cl.[4] F16H *3/08*
U.S. Cl. 74—360 **18 Claims**

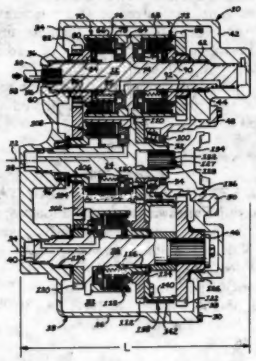
1. A countershaft transmission comprising:

an input shaft, an output shaft and an intermediate shaft arranged in parallel relation;

a reverse clutch assembly and a forward clutch assembly mounted on the input shaft;

a first speed clutch assembly mounted on the output shaft;

a second speed clutch assembly mounted on the intermediate shaft; and



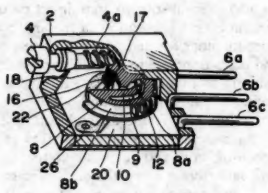
gear means mounted on the shafts and operatively associated with each other for effecting two forward and two reverse output shaft speeds in response to rotation of the input shaft and selective actuation of the clutch assemblies.

4,627,303

VARIABLE RESISTANCE DEVICE

Masashi Hirose, Iruma, Japan, assignor to Copal Electronics Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1984, Ser. No. 637,535
Claims priority, application Japan, Aug. 4, 1983, 58-140709
Int. Cl.[4] F16H *1/16, 1/20, 57/00*; H01C *10/34*
U.S. Cl. 74—425 **7 Claims**



1. A variable resistance device, comprising:

a resistive element and a conductive element;

a contact member in movable contact with said resistive and conductive elements;

and means for moving one of said contact member, and said resistive and conductive elements, relative to the other, said means including

a worm screw having thread, rotatable about a worm screw axis in opposite directions,

a worm gear, rotatable in opposite directions about a worm gear axis, having a periphery surrounding said worm gear axis and gear teeth along said periphery except a toothless sector devoid of gear teeth, said teeth being engaged by said thread such that rotation of said screw rotates said gear in a corresponding direction about said worm gear axis, said gear being rotatable by said screw to a position in which said screw opposes said toothless sector and is out of engagement with said teeth,

a housing, said gear being mounted in said housing,

a resilient finger resiliently fixed to and carried by said gear, said gear having a stop member thereon, and

channel means defining an arcuate channel formed in said

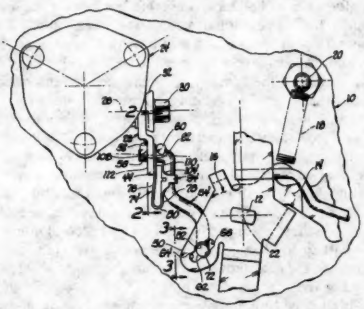
housing, said channel having opposite end surfaces formed in said housing, said resilient finger being fixed to said gear, said gear being rotatively moveable relative to said channel means, said stop projecting into said channel and being relatively moveable therein between said end surfaces with rotation of said gear about said worm gear axis such that when said gear rotates in one direction corresponding to a corresponding rotational direction of said screw, out of engagement with said screw with said toothless sector opposing said threads, said stop abuts one of said end surfaces and said one end surface resiliently deforms said finger so as to bias said gear in a direction opposite said one direction so as to enable said teeth to re-engage said screw when said screw is rotated oppositely to the direction corresponding to said one direction of rotation of said gear.

4,627,304

LINKAGE ANTI-RATTLE DEVICE AND ARRANGEMENT

Michael Dougherty, East Detroit, and William J. House, Sterling Heights, both of Mich., assignors to Colt Industries Operating Corp, New York, N.Y.

Filed Apr. 19, 1985, Ser. No. 725,107
Int. Cl.⁴ G05G *1/00*; F02M *19/12*; F16B *7/04*
U.S. Cl. 74—469 **7 Claims**



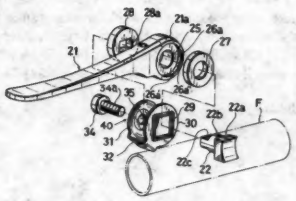
1. An anti-rattle apparatus for use in combination with first and second operatively interconnected linkage means in order to at least minimize the occurrence of rattling noises between said first and second linkage means, and wherein at least one of said linkage means carries abutment means, said anti-rattle apparatus comprising a first body portion having first and second ends, a second body portion having first and second ends, a resilient bight portion integrally joined to said first end of said first body portion and to said first end of said second body portion, and a connector portion carried by said second body portion as to be spaced from said bight portion, said connector portion being effective for operative connection to said second linkage means, said second end of said second body portion being effective to be placed in operative engagement with said second linkage means as to thereby resiliently urge said first and second linkage means in respectively opposite directions until said abutment means of said at least one of said linkage means operatively abuts against the other of said linkage means.

4,627,305

BICYCLE SPEED CHANGE LEVER

Mikio Hosokawa, Osaka, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Jun. 19, 1985, Ser. No. 746,517
Claims priority, application Japan, Jun. 19, 1984, 59-91269[U]
Int. Cl.⁴ G05G *11/00*
U.S. Cl. 74—489 **5 Claims**



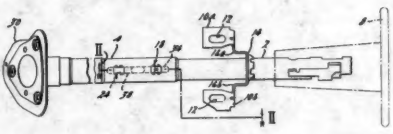
1. A bicycle speed change lever comprising:
a stationary support spindle adapted to be fixed to a bicycle frame tube and having an internally threaded axial hole formed therein,
a lever handle rotatably mounted at its holded end portion on said spindle,
a plurality of washers supported on said spindle,
a clipping holder which has a pair of axially spaced, holed disk-like portions, that is, an outside disk-like portion and an inside disk-like portion, resiliently connected to an integral cross arm and which is non-rotatably mounted on said spindle,
said inside disk-like portion being provided with means for preventing relative rotation of said clipping holder with respect to said spindle,
said washers and said holed end portion of the lever handle being sandwiched between said pair of disk-like portions and held together by pressure, and
a lock bolt having a threaded shank engaged with said threaded axial hold of said spindle.

4,627,306

ENERGY ABSORBING STEERING COLUMN FOR MOTOR VEHICLES

Karim Berenjian, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 7, 1985, Ser. No. 689,538
Int. Cl.⁴ B62D *1/18*
U.S. Cl. 74—492 **24 Claims**



1. An energy absorbing steering column comprising:
an upper column tube;
a lower column tube telescopically engaged with said upper column tube;
a steering shaft rotatably suppended within said telescopically engaged lower and upper column tubes;
a steering wheel secured to the rearward end of said steering shaft;
first means for mounting said upper column tube to a vehicle body and for absorbing impact loads through plastic deformation as said column tubes move together axially; and
second means for securing said upper column tube to said

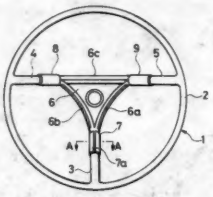
lower column tube and for allowing said tubes to move axially relative to each other inhibited only by said first means for an initial segment of travel, followed by one or more segments of travel characterized by inhibition resulting from the action of both of said means.

4,627,307

FIBER-REINFORCED PLASTIC CORE MATERIAL FOR STEERING WHEELS

Yasushi Yamazawa; Yasuhiro Tsutiya; Masaki Terada; Tosio Aoki, and Hiroyuki Sato, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 22, 1985, Ser. No. 757,498
Claims priority, application Japan, Sep. 6, 1984, 59-186790
Int. Cl.⁴ B62D *1/04*
U.S. Cl. 74—552 **9 Claims**



1. A method of forming a core material for steering wheels, comprising the steps of:

setting a boss in the center of a jig formed in the shape of a ring which has spoke portions, said boss having sleeves each of which is provided with a slit and being positioned relative to said jig such that said sleeve align with the spoke portions of said jig;

forming at least two spokes of said core material by winding and stretching, in a superposed manner, continuous long-staple fiber strands impregnated with a resin around the boss and the spoke portions of said jig, while introducing said continuous long-staple fiber strands into said sleeves through the slits therein; and

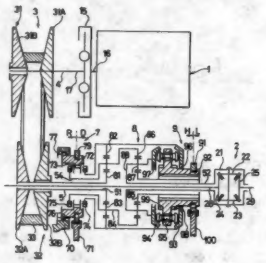
removing said jigs after said resin has hardened.

4,627,308

AUTOMATIC TRANSMISSION FOR A VEHICLE

Shuzo Moroto, and Shiro Sakakibara, both of Aichi, Japan, assignors to Aisin Warner Kabushiki Kaisha, Aichi, Japan

Filed Apr. 27, 1984, Ser. No. 604,722
Int. Cl.⁴ F16H *37/02*
U.S. Cl. 74—689 **2 Claims**



1. An automatic transmission for a vehicle, comprising:

a coupling means having an input shaft and an output shaft;

a belt type continuously-variable speed transmission system having an input pulley mounted coaxially on a first shaft, an output pulley mounted coaxially on a second shaft and a belt extending between said first and second pulleys to transfer power, each of said first and second pulleys having a fixed sheave and a movable sheave, said first shaft being disposed coaxially with and rotatably coupled with said output shaft of said coupling means, said second shaft being disposed side by side and in parallel with said first shaft;

a planetary gear mechanism having a first planetary gear set including a first sun gear, a first planetary gear, a first ring gear and a first planetary carrier, a second planetary gear set including a second sun gear, a second planetary gear, a second ring gear and a second planetary carrier, an input shaft disposed coaxially with and rotatably coupled at one end thereof with said second shaft of said belt type continuously-variable speed transmission system connected at the other end thereof concentrically with said first sun gear, an output shaft disposed coaxially with said input shaft and connected at one end thereof concentrically with said second planetary carrier, a first intermediate shaft disposed concentrically with and radially outward in connection with said input shaft and connected at one end thereof with said first ring gear and said second sun gear and a second intermediate shaft disposed concentrically with and between said input shaft and said first intermediate shaft in radial direction and connected at one end thereof with said first planetary carrier and said second ring gear, each of said first and second intermediate shaft having splines on an outer circumference thereof at the other end which is positioned between said output pulley of said belt type continuously-variable speed transmission system and said planetary gear mechanism;

a forward-reverse changeover mechanism having one and single shift lever and one and single first sleeve, said first sleeve being positioned between said output pulley of said belt type continuously-variable speed transmission system and said planetary gear mechanism and disposed concentrically with and slidably movable but nonrotatable with respect to the rotational axis of said input shaft of said planetary gear mechanism and having splines on an inner circumference thereof adapted to selectively mesh with said splines formed on said first and second intermediate shafts, said shift lever being adapted to shift said first sleeve between a first position where said splines formed on said first sleeve is selectively meshed with said splines formed on said first intermediate shaft to hold said first ring gear and second sun gear in a stationary position to establish a forward range gear train and a second position where said splines formed on said first sleeve is selectively meshed with said splines formed on said second intermediate shaft to hold said first planetary carrier and said second ring gear in a stationary position to establish a reverse range gear train, and

a low-high speed changeover mechanism having a second sleeve disposed concentrically with and slidably and rotatably with respect to the rotational axis of said output shaft of said planetary gear mechanism, a first and second discs disposed perpendicularly to and rotatably with respect to the rotational axis of said output shaft of said planetary gear mechanism, respectively, and a shift lever being engaged with said second sleeve at one end thereof, said first disc being linked to said first ring gear and having splines on an inner circumference thereof, said second disc being linked to said second planetary carrier and having splines on an inner circumference thereof, said second sleeve being slidably connected to and integrally rotatable with said second sun gear and having splines on an outer circumference thereof and adapted to selectively mesh with said splines formed on said first and second discs, said shift lever being adapted to shift said second sleeve between a first position where said splines formed on said second sleeve is meshed with said splines formed on said first disc to establish a forward speed range gear train and a second position where said splines formed on said second sleeve is meshed with said splines formed on said

second disc to establish another forward speed range gear train.

4,627,309

ACCESSORY DRIVE DEVICE IN ENGINE

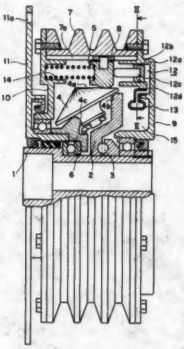
Kazutoshi Kaneyuki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1985, Ser. No. 802,749

Claims priority, application Japan, Nov. 30, 1984, 59-182907

Int. Cl.[4] F16H *17/06, 15/50, 15/16*

U.S. Cl. 74—752 C **5 Claims**



1. A device for driving accessories such as an alternator, a cooling water pump, an air-conditioning compressor or the like, utilizing power taken from an output shaft of an engine, said device comprising:

an input shaft rotatably supported by a stationary element and receiving output from said output shaft and rotated at a rotational speed corresponding to that of said output shaft;

a transmission output member rotatably supported on said input shaft for transmitting power to said accesories;

a planetary cone which can rotate on said input shaft in revolution around the axial center of the input shaft and in rotation around its axial center inclined with respect to said axial center of the input shaft, said planetary cone having a first part of nearly conical shape, and a second part of nearly cylindrical shape leading to a bottom surface of the first part, and first, second and third frictional transmission surfaces being formed on the conical surface of the first part, the bottom periphery of the first part and the circumferential surface of the second part, respectively;

an input transmission member installed rotatable with said input shaft and engaged at outer periphery in frictional engagement with the second frictional transmission surface of said planetary cone;

an orbit ring installed non-rotatably with respect to said stationary element, said orbit ring extending along the revolution path of said planetary cone and having an annular frictional engaging surface to be engaged in frictional engagement with the third frictional transmission surface of said planetary cone;

a shifting ring supported on said transmission output member and movable only in the axial direction thereof and having a frictional engaging surface engaged in frictional engagement with the first frictional transmission surface of said planetary cone always within the movable region in the axial direction;

a hydraulic piston/cylinder assembly for setting the position of said shifting ring adjustably toward or away from the rotation center of said planetary cone; and

a Pitot tube for supplying the inside of a hydraulic cylinder of said hydraulic piston/cylinder assembly with hydraulic pressure corresponding to the rotational speed of said transmission output member.

4,627,310

RATIO SPEED ADAPTOR

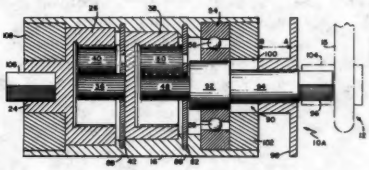
Brian Coburn, 79 Bailey St., Lawrence, Mass. 01843

Continuation-in-part of Ser. No. 408,135, Aug. 16, 1982, Pat. No. 4,535,653. This application Aug. 19, 1985, Ser. No. 766,928

The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.

Int. Cl.[4] F16H *57/10, 3/44, 1/28;* **B25B** *17/00*

U.S. Cl. 74—763 **1 Claim**



1. A speed transformer adaptor comprising;

a substantially cylindrical casing;

a first gear system coaxially and rotatable positioned in fixed alignment within said casing comprising a first portion forming a first drive shaft extending beyond one end of said casing, and a second integral cylindrical portion having internal gear teeth;

a second gear system coaxially and rotatably positioned within said casing and in fixed longitudinal alignment with said first gear system comprising a first portion forming a sun gear coaxially positioned within the cylindrical portion of said first gear system and having external gear teeth, and a second integral cylindrical portion having internal gear teeth;

a first pinion gear disposed in fixed position within the cylindrical portion of said first gear system and meshing with said sun gear of said second gear system and said internal gear of the cylindrical portion of said first gear system;

a third gear system coaxially and rotatably positioned within said casing and in fixed longitudinal alignment with said first and second gear systems comprising a first portion forming a sun gear coaxially positioned within the cylindrical portion of said second gear system and having external gear teeth, and a second integral portion forming a second drive shaft extending beyond the other end of said casing;

a second pinion gear disposed in fixed position within the cylindrical portion of said second gear system and meshing with the sun gear of said third gear system and the internal gear of the cylindrical portion of said second gear system; and

a clutch member slidably mounted on said second drive shaft of said third gear system and adapted to slidably engage said casing whereby to interlock said casing and gear systems to provide a direct drive between said first and second drive shafts.

4,627,311

AUTOMOTIVE DRIVING CONTROL SYSTEM UTILIZING A STEPLESS TRANSMISSION

Katsuhiko Yokooku; Nobuhide Seo; Hiroyuki Oda; Shizuo Sumida, and Satoshi Yatomi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Mar. 21, 1984, Ser. No. 591,876

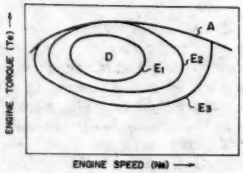
Claims priority, application Japan, Apr. 11, 1983, 58-64364

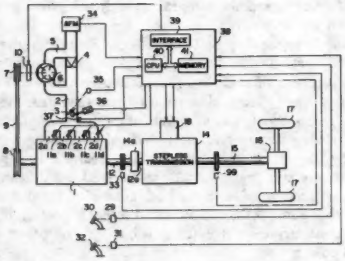
Int. Cl.[4] B60K *41/18, 41/12*

U.S. Cl. 74—866 **15 Claims**

1. An automotive driving control system comprising a step-

less transmission provided between an engine and driving wheels, a transmission control means for controlling the transmission ratio of the stepless transmission, a throttle valve driving means for driving the throttle valve of the engine, an accelerator position detecting means for detecting the amount of depression of the accelerator pedal, an actuable engine torque increasing means for increasing engine torque, and control means which receives the signal from the accelerator position detecting means and controls the transmission control means and the throttle valve driving means according to the amount of depression of the accelerator pedal, said control means being adapted to control, when the amount of depression of the accelerator pedal is within a predetermined range between first and second preset values, the throttle valve driving means so that the opening degree of the throttle valve is fixed at a near full open position irrespective of the amount of depression of the accelerator pedal, and to control the transmission control means to control the transmission ratio of the stepless transmis-





sion to change the engine speed so that the engine output requirement represented by the amount of depression of the accelerator pedal can be obtained with the near full open position of the throttle valve, said first preset value being smaller than said second preset value; when the amount of depression of the accelerator pedal is not larger than the first preset value, to control the transmission control means to control the transmission ratio of the stepless transmission so that the engine speed is maintained at the minimum stable speed and to control the throttle valve driving means to control the opening degree of the throttle valve so that the engine output requirement represented by the amount of depression of the accelerator pedal can be obtained; and when the amount of depression of the accelerator pedal is larger than the second preset value, controls the transmission control means to control the transmission ratio of the stepless transmission so that the engine speed is maintained at the maximum stable speed and said engine torque increasing means is actuated so that engine torque is increased.

4,627,312

AUTOMATIC TRANSMISSION

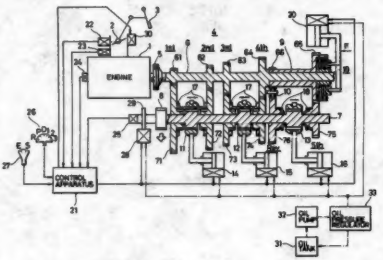
Mamoru Fujieda, Tomobe, and Yoshishige Oyama, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 762,327

Claims priority, application Japan, Aug. 10, 1984, 59-166438

Int. Cl.[4] B60K *41/18*; F16H *5/46*

U.S. Cl. 74—866 **7 Claims**



1. An automatic transmission for an automobile comprising;

a first and a second shaft, one of which is connected to an engine of the automobile and the other is connected to a load;

a plurality of gear pairs having different reduction ratios only one pair of which is selected and conducts the torque transmission between said first and second shafts;

a torque transmitting means provided between said first and second shafts for sharing the torque transmission at least during the change of the selection of said gear pairs, the degree of the torque transmitted being adjustable in accordance with the condition of the operation of the engine and the load; and

a control means which receives signals representative of the condition of the operation of the engine and the load and outputs signals for selecting the gear pair and adjusting the degree of the torque transmission of said torque transmitting means wherein, when the ratio of the number of revolutions between said both shafts becomes substantially equal to a predetermined value, one of said gear pair having the reduction ratio corresponding to the predetermined value of said ratio of the number of revolutions is selected to effect the torque transmission between said both shafts.

4,627,313

CONTROL SYSTEM FOR AN INFINITELY VARIABLE TRANSMISSION

Yasuhito Sakai, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 696,000

Claims priority, application Japan, Jan. 30, 1984, 59-14750

Int. Cl.[4] B60K *41/12*

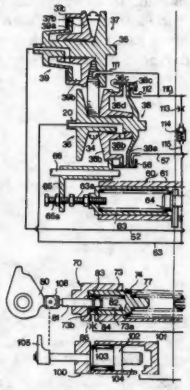
U.S. Cl. 74—867 **3 Claims**

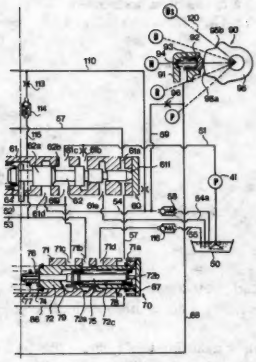
1. In a control system for an infinitely variable belt-drive transmission having a selector device including a drive range position and a neutral position, a drive pulley having a hydraulically shiftable disc and a servo chamber for shifting the disc, a driven pulley having a hydraulically shiftable disc and a servo chamber for shifting the disc, and a belt engaged with both the pulleys, a hydraulic control circuit for supplying oil to the servo chambers and for draining the servo chambers, the hydraulic control circuit being provided with a pressure regulator valve for providing a line pressure and a transmission ratio control valve for applying the line pressure to the servo chamber of the drive pulley, the improvement comprising:

a lubricating oil circuit provided in the hydraulic control circuit for supplying lubricating oil to the drive and driven pulleys;

a passage for supplying a part of the lubricating oil to the servo chamber of the drive pulley;

a check valve provided in the passage for preventing the reverse flow of the lubricating oil; and





a select position detecting valve for enabling the supply of the lubricating oil to the servo chamber at the selection of the neutral position.

4,627,314

STRIPPING DEVICE, PARTICULARLY FOR CONDUCTORS WITH TOUGH INSULATION

Ulrich Wiebe, Dörentrup, and Manfred Wilmes, Detmold, both of Fed. Rep. of Germany, assignors to C.A. Weidmuller GmbH & Co., Detmold, Fed. Rep. of Germany

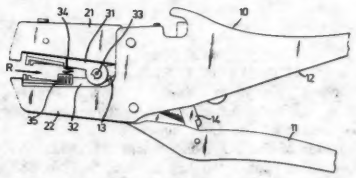
Filed Oct. 25, 1984, Ser. No. 664,613

Claims priority, application Sweden, Nov. 9, 1983, 8306163

Int. Cl.[4] H02G 1/12

U.S. Cl. 81—9.43 **13 Claims**

1. A stripping device, in particular for electrical conductors having a tough insulation and provided with a cutting means and with a positioning device for locating and retaining a treated conductor at a selected position relative to the cutting means, the stripping device comprising a pair of jaws movable toward and away from one another and an actuating means for at least one of the jaws to perform said movement; each said jaw extending in a longitudinal direction between a front end and a rear end and provided at said front end with an insulation cutting knife defining a part of said cutting means and having a front face, a rear face and a cutting edge, all extending transversely to said longitudinal direction, said positioning device comprising in a first jaw of said pair of jaws a first grasping member closely adjacent the rear face of the respective knife, and having a tapering recess defining said selected position; a resilient carrier arm extending parallel to said longitudinal direction between a front end and a rear end and supporting at its said front end the first grasping member so as to urge it exclusively by resilient force in a maximally projecting position relative the adjacent cutting edge when the jaws are maximally moved apart; said rear end being fixedly anchored in the first jaw and in the second jaw of said pair of jaws, opposite said recess, a second grasping member extends parallel to the rear face of the respective cutting knife, and is carried at the front end of a second resilient carrier arm extending parallel to said longitudinal direction between a front and a rear end and resiliently urging the second grasping member in a maximally projecting position relative the adjacent cutting edge when the



jaws are maximally moved apart, said rear end of the second resilient carrier arm being fixedly anchored in the second jaw, said second grasping member cooperating with said first grasping member in forcing the treated conductor into said recess to retain it there by the effect of said resilient force opposing the retreat of the first grasping member from its maximally projecting position, so that a conductor is grasped and guided before the cutting edge of the respective cutting knife begins to penetrate into the insulation layer, the first grasping member resiliently recedes until the cutting edge has reached its end position in the insulation layer, and an outer pair of jaws embodying a part of said actuating means and wherein said pair of jaws is mounted in the outer pair of jaws for translatorial rearward movement relative thereto in the sense of said longitudinal direction when actuated by said actuating means so as to tear off and move rearward a severed portion of the insulation, said outer pair of jaws including a means for gripping the conductor during said rearward movement of said pair of jaws.

4,627,315

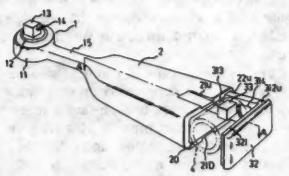
SOCKET WRENCH WITH ATTACHABLE SOCKET STORAGE MEANS IN HANDLE

Patrick Lin, 12th Fl., No. 1034, Min Sheng East Rd., Taipei, Taiwan

Filed Jul. 2, 1985, Ser. No. 751,209

Int. Cl.[4] B25G 1/08

U.S. Cl. 81—177.4 **4 Claims**



1. A socket wrench with an attachable socket storage means, comprising:

a head carrying a socket mounting stub,

a longitudinally extending handle provided with a storage

cavity therein for housing said attachable socket storage means, and

a neck integrally connecting said head and handle together, said attachable socket storage means being longitudinally slidable relative to said handle and comprising:

a side plate and a cover plate connected together to form an L-shaped structure wherein said plate is longitudinally slidable within said cavity and is provided with a narrow, longitudinally elongate guide slot, said slot having one end thereof formed with an enlarged aperture, and

a plurality of mounting stubs for carrying sockets, each stub comprising:

a rectangular portion for mating with a rectangular hole in a socket,

a projecting portion, and

a narrow neck integrally connecting said rectangular and projecting portions together such that said projecting portion is insertable through said enlarged aperture to slidably disposed said neck within said slot.

4,627,316

AUTOMATIC SCREWDRIVER

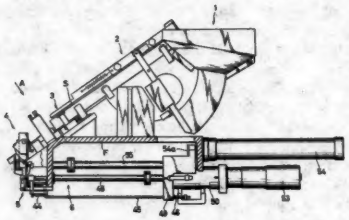
Takashi Mori, Koriyama; Kouichi Mizu, Hirakata, and Yasunori Jo, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 370,194, Apr. 21, 1982, Pat. No. 4,495,841. This application Jan. 2, 1985, Ser. No. 688,828

The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.

Int. Cl.[4] B25B *23/06*

U.S. Cl. 81—430 **9 Claims**



1. An automatic screwdriver for driving a screw into a workpiece, comprising:

a frame;

a chute mounted on said frame for supporting a plurality of screws arranged in a row in the chute, said screws having shanks directed generally parallel to each other in a first direction;

a gate mounted on said frame at one end of said chute and being selectively openable to allow the screws to be discharged one at a time out of said chute;

an index mechanism mounted on said frame and having a carrier arm angularly movable between a first position in which said carrier arm receives a screw discharged by said gate and a second position in which said screw is oriented in a second direction different from said first direction;

a catcher unit mounted on said frame at said second position to receive the screw supplied from said index mechanism;

a screwdriver bit unit mounted on said frame and having an axially movable suction pipe for drawing the screw from said catcher unit into the pipe and towards a screwdriver bit rotatably disposed in said suction pipe for axial movement therewith to advance the screw past said catcher unit;

means for actuating the gate; and

means for actuating said screwdriver bit unit, wherein said chute has a groove extending therealong to receive the shanks of said screws, said gate including an escape slide having a curved slot, the escape slide being slidable transversely of said chute for allowing one of the screws at a time to move along said groove and said curved slot past said gate and wherein said escape slide has a roller cam follower, said gate and index mechanism actuating means having a cam surface engageable with said roller cam follower for moving said escape slide to open said gate in response to movement of said carrier arm to said first position.

4,627,317

CONSUMABLE CERAMIC LEDGE TOOL

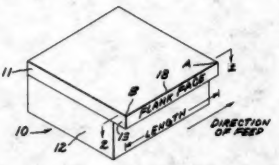
Ranga Komanduri, and William R. Reed, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,319

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.[4] B23B *1/00, 27/16*

U.S. Cl. 82—1 C **12 Claims**



7. The high-speed method for the machining of a metal workpiece of superalloy composition, which comprises the steps of

(a) rigidly mounting a cutting tool relative to said workpiece with a cantilevered longitudinally-extending portion of said tool as the cutting element thereof, the material of said cutting element being an alumina-base ceramic having a value for transverse rupture strength in the range of from about 80 Ksi to about 150 Ksi and a value for fracture toughness in the range of from about 4 to about 7, said cutting element providing the flank and rake faces of said tool with said flank face being located a substantially uniform distance in the range of from 10 mils to 60 mils from any support for said cutting element and having a clearance angle to the workpiece of about one degree or less, said cutting element (a) having a maximum substantially uniform thickness in the range of from 20 mils to 60 mils and (b) being of substantially uniform transverse cross-section along said length;

(b) rotating said workpiece at a speed of at least about 1000 surface feet per minute;

(c) bringing said cutting element against said rotating workpiece with a depth of cut of at least about 0.015 inch and a feed of at least 0.0025 inch per revolution; and

(d) advancing said tool to maintain contact between said cutting element and said workpiece as metal is removed from said workpiece and said cutting element is consumed by wear along the length thereof, said wear being of the brittle microchipping type.

4,627,318
METHOD OF AND APPARATUS FOR GAPPING A SLIDE-FASTENER TAPE

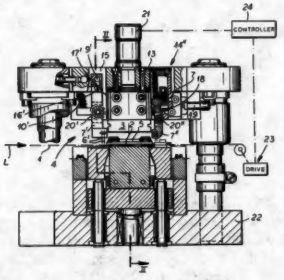
Franz Hochlehnert, Essen; Werner Rademacher, Essen-Kettwig, and Lothar Grosskreuz, Dortmund, all of Fed. Rep. of Germany, assignors to Opti Patent-, Forschungs- und Fabrikations-AG, Riedern-Allmeind, Switzerland

Filed Dec. 13, 1985, Ser. No. 808,889

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1984, 3445865

Int. Cl.[4] B26D *7/02, 7/14*

U.S. Cl. 83—18 **9 Claims**



1. In a method of gapping a slide-fastener assembly comprising a pair of longitudinally extending and parallel tapes having adjacent edges carrying respective coupling coils that form coupling heads and that are interleaved with one another, the method comprising the steps of:

advancing the assembly in steps through a punching location;

engaging the coils upstream and downstream of the location by respective upstream and downstream grippers and holding the assembly stationary in the station between steps; and

punching the heads off the coils between the grippers while the assembly is held stationary in the station, the improvement comprising the step of

displacing the grippers apart to longitudinally tension the coils after engaging the grippers with the coils and before punching the heads off the coils.

4,627,319
DEVICE FOR SUPPLYING WEBS OF WRAPPING MATERIAL TO A CIGARETTE MAKING MACHINE OF THE TWO ROD TYPE

Riccardo Mattei, and Armando Neri, both of Bologna, Italy, assignors to G.D. Societa per Azioni, Bologna, Italy

Filed Feb. 22, 1985, Ser. No. 704,589

Claims priority, application Italy, Feb. 23, 1984, 3351 A/84

Int. Cl.[4] B23Q *15/22*

U.S. Cl. 83—73 **7 Claims**

1. A device for supplying webs of wrapping material to a cigarette making machine of the two rod type, comprising:

a cutter means for separating longitudinally a web of wrapping material, defined as the main web, into a first web and a second web;

means for guiding the main web to the cutter means;

means for guiding the first and the second web to a utilization area;

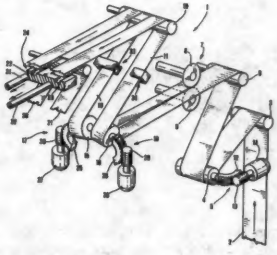
a first deviation device associated with said main web for detecting the displacement thereof in a direction crosswise to that in which said main web moves forward;

two additional deviation devices, one of which is associated with said first web and the other of which is associated with said second web, for detecting the respective displacement thereof in a direction crosswise to the directions in which the first and second webs move forward;

motor means for driving the first deviation device and the two additional deviation devices; and

detector means for checking and correcting the width and the position of the first web and the second web;

said detector means being associated with said first web and said second web for checking, upstream of the utilization



area, the width of at least one of the first web and the second web and the position of their edges;

said detector means including circuit means interlocked thereto for operating, in response to output signals of the detector means, the motor means with respect to each of said deviation devices until corrections of the widths and the positions of the first web and the second web are effected.

4,627,320
COMPACT SHEARING MACHINE WITH SCRAP SHEARS

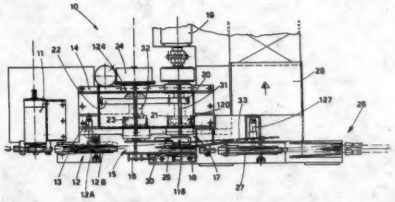
Giorgio Fuccaro, Udine, Italy, assignor to Danieli & C. Officine Meccaniche S.p.A., Italy

Filed Jan. 23, 1985, Ser. No. 694,078

Claims priority, application Italy, Jan. 27, 1984, 83311 A/84

Int. Cl.[4] B23D *5/12*

U.S. Cl. 83—163 **14 Claims**



1. A compact shearing machine containing scrap shears, said machine comprising

a shears means for cutting objects to size,

a scrap shears means,

motor means to actuate at least said scrap shears means,

a scrap shearing channel located downstream of said shears means and leading to said scrap shears means,

a shearing-to-size channel located downstream of said scrap shears means and leading to at least one collection channel, said scrap shearing channel and said shearing-to-size channel being positioned substantially in parallel, said scrap shears means located in a position offset from said shears means for cutting objects to size, and

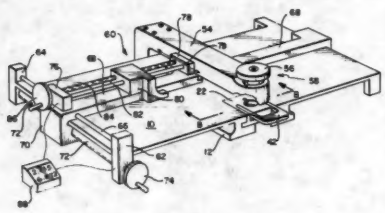
means for directing the objects to be cut to either said scrap shearing channel or said shearing-to-size channel, said means for directing located upstream of said shears means.

4,627,321

PUNCH PRESS MACHINE INCLUDING A WORKPIECE POSITIONING MEANS WITH A QUICK CHANGE DIE HOLDER, PUNCH AND STRIPPER UNIT

Scott B. Moore, 2401 S. 6th St., Springfield, Ill. 62703

Filed Dec. 10, 1985, Ser. No. 807,138
Int. Cl.[4] B26F *1/14*; B21D *28/34*
U.S. Cl. 83—468 6 Claims



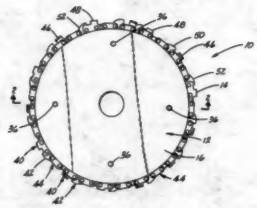
1. A punch press machine assembly including a workpiece supporting table and a table support means which comprises:
an opening in said supporting table and said table support for receiving a die holder,
said die holder including a die opening for receiving a die therein,
oppositely disposed pins on opposite sides of said die opening, and
a U-shaped handle connected to said oppositely disposed pins for lifting and lowering said pins for removal and replacement of said die holder.

4,627,322

CIRCULAR SAW BLADE ASSEMBLY

Vondene D. Hayhurst, Jr., Nicoma Park, Okla., assignor to Lebever Co., Oklahoma City, Okla.

Filed Sep. 17, 1985, Ser. No. 777,241
Int. Cl.[4] B23D *61/02*; B27B *17/02, 33/14*
U.S. Cl. 83—831 5 Claims



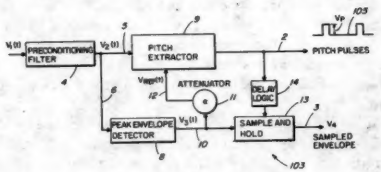
1. A circular saw blade assembly adapted to be secured to a power-driven saw arbor and rotated thereby, the circular saw comprising:
a circular saw blade formed of first and second discs, the first and second discs each being characterized as having a medial portion, a peripheral portion and a central bore extending through the medial portion, the medial portions being disposed substantially adjacent so that the bores therein are aligned and adapted to receive the power-driven saw arbor in an assembled mode of the first and second discs, the first and second discs diverging radially from the medial portion defining the bore to form a relief opening extending to the peripheral portion of the discs so that the peripheral portions of the first and second discs define a chain track peripheral portion;
disc connector means disposed within the relief opening for connecting the first and second discs at a position between the medial portions of the first and second discs and the chain track peripheral portion in the assembled mode thereof; and,
a saw chain having a plurality of cutter elements projecting outwardly from one side thereof and a plurality of drive link elements projecting outwardly from an opposite side thereof, the saw chain extendible about the perimeter of the first and second discs such that the drive link elements are disposed within the chain track peripheral portion and frictionally engage the first and second discs defining the chain track peripheral portion.

4,627,323

PITCH EXTRACTOR APPARATUS AND THE LIKE

Calman Gold, Post Mills, Vt., assignor to New England Digital Corporation, White River Junction, Vt.

Filed Aug. 13, 1984, Ser. No. 639,737
Int. Cl.[4] G10H *1/00, 3/18*
U.S. Cl. 84—1.01 23 Claims

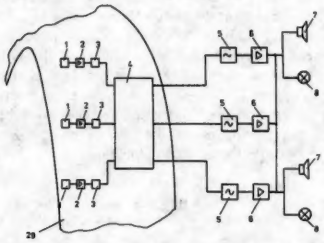


1. A method of extracting the fundamental pitch period of a complex electrical signal $V_2(t)$, that comprises the serial steps:
deriving a time varying reference signal $V_{ref}(t)$ from the complex electrical signal $V_2(t)$, which reference signal $V_{ref}(t)$ adjusts each cycle to peak amplitude excursions of the complex electrical signal $V_2(t)$;
sensing ascending values of the signal $V_2(t)$ to a first point at which the maximum magnitude of the signal $V_2(t)$ of one polarity is reached and reversal of direction thereof occurs;
storing the first substantially instantaneous difference in magnitude between the complex electrical signal $V_2(t)$ and the time varying reference signal $V_{ref}(t)$ at said first point;
thereafter sensing a point at which the magnitude of the signal $V_2(t)$ minus said first substantially instantaneous difference equals zero;
thereafter sensing ascending values of the signal $V_2(t)$ to a further point at which a maximum magntiude of the signal $V_2(t)$ of opposite polarity to said one polarity is reached and reversal of direction thereof occurs;
then storing the value of the signal $V_2(t)$ at said further point; and
sensing ascending value of the signal $V_2(t)$ to a still further point at which the substantially instantaneous value of the signal $V_2(t)$ exceeds the stored value of the signal $V_2(t)$ at said further point by an amount equal to the substantially instantaneous value of the time varying reference signal $V_{ref}(t)$, said pitch period being the time span between successive occurrences of said still further point.

4,627,324
METHOD AND INSTRUMENT FOR GENERATING ACOUSTIC AND/OR VISUAL EFFECTS BY HUMAN BODY ACTIONS

Helge Zwosta, Görresstrasse 2, D-8902 Neusäss, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,163
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 3422737
Int. Cl.[4] G09B *15/04*; G10H *1/00*
U.S. Cl. 84—1.01 **19 Claims**

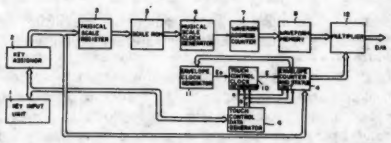


1. An instrument for generating at least one of acoustic and visual effects by human body actions comprising:
(a) a plurality of transducer means each adapted to be attached to desired parts of the human body and responsive to accelerations/decelerations caused by a movement thereof to generate electrical signals;
(b) means for producing at least one of said acoustic and visual effects;
(c) a plurality of drive signal generator means for driving said producing means;
(d) logic means connected between said plurality of transducer means and said plurality of drive signal generator means for selectively routing said electrical signals generated by predetermined of transducer means to predetermined of said drive signal generator means.

4,627,325
TOUCH RESPONSE APPARATUS FOR ELECTRONIC MUSICAL APPARATUS

Youji Kaneko, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Division of Ser. No. 512,143, Jul. 8, 1983, Pat. No. 4,535,669. This application Feb. 12, 1985, Ser. No. 700,628
Claims priority, application Japan, Jul. 13, 1982, 57-120551; Jul. 13, 1982, 57-120552; Jul. 13, 1982, 57-120553
Int. Cl.[4] G10H *1/057*
U.S. Cl. 84—1.26 **7 Claims**

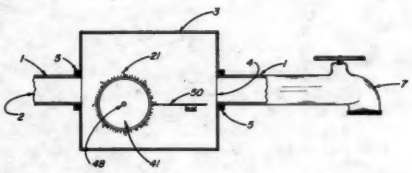


1. A touch response apparatus for an electronic musical instrument having a keyboard, comprising,
touch data generating means for generating touch data as a function of a key depression status of an operated key of said keyboard;
envelope generating means for generating envelope data corresponding to an envelope, said envelope generating means including means for counting up to a level data corresponding to each said touch data generated by said touch data generating means in an attack status of the operated key, and means for counting down from said level data in a release status of the operated key;
said envelope generating means including:
setting means for establishing a reached value of a count value of said counting up means in accordance with said touch data generated by said touch data generating means;
relative value data generating means for generating a relative value data of a present value data of said envelope data generated by said counting up means and counting down means relative to said reached value data; and
count rate control means for controlling a count rate of said counting up means and counting down means in accordance with said relative value data generated by said relative value data generating means; and
control means coupled to said envelope generating means and to said touch data generating means for comparing the envelope data with said touch data so as to change the count status of said envelope generating means according to the comparing result.

4,627,326
MUSICAL FAUCET

John McFarland, Box 478, Victor, Mont. 59875

Filed Jul. 11, 1985, Ser. No. 753,885
Int. Cl.[4] G10F *1/06*
U.S. Cl. 84—94 C **12 Claims**



1. A musical water faucet apparatus:
a water conduit;
water take-off means located within said conduit;
a water tap for controlling the flow of water within said conduit; and
music production means connected to and driven by said waterpower take-off means.

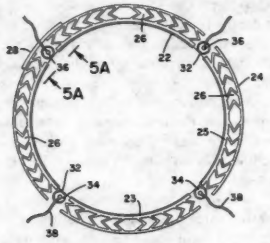
4,627,327
HYBRID UNITIZED SHOCK AND VIBRATION MITIGATION SYSTEM

Michael S. Huber, Milpitas, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 3, 1985, Ser. No. 740,673
Int. Cl.[4] F41F *3/04*
U.S. Cl. 89—1.816 **4 Claims**

1. A shock absorbing system circumferentially arrayed within a launch tube around a missile comprising:
(a) a first plurality of arcuate sheets bonded to said launch tube;
(b) a second plurality of regularly segmented arcuate sheets also spaced radially inward from said first plurality of arcuate sheets;
(c) a structured array of shock absorbing struts located between said first and said second plurality of arcuate sheets to form a plurality of regularly segmented pad rings positioned about said missile;
(d) means for connecting said plurality of regularly segmented pad rings such that lateral movement of said mis-

sile into any portion of said pad rings is resisted by all of said shock absorbing struts in said pad rings; and



(e) means for varying the shock absorbing characteristic of said means for connecting said pad rings.

4,627,328

HYDRAULIC ACTUATOR-CONTROL ARRANGEMENT FOR CONCRETE PUMP

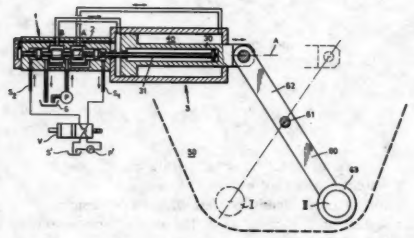
Klaus-Helmut Renders, Unna-Stockum, Fed. Rep. of Germany, assignor to Maschinenfabrik Walter Scheele GmbH & Co. KG, Unna-Massen, Fed. Rep. of Germany

Filed Sep. 20, 1984, Ser. No. 652,761

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 3333849

Int. Cl.[4] F15B *13/042*

U.S. Cl. 91—410 **4 Claims**



1. In combination with a concrete pump having a distributor pipe displaceable by a controlled element between positions corresponding to end positions of the controlled element, a hydraulic controlling and actuating system comprising:

a hydraulic source having a high-pressure side and a low-pressure side;

means including a hydraulic actuator connected to the element and having one compartment pressurizable for moving the element into one of its end positions and another compartement pressurizable for moving the element into the other of its end positions;

a valve having

a source-side port connected to the high-pressure side,

a source-side port connected to the low-pressure side,

respective valve-side ports connected to the actuator compartments, and

a valve body displaceable from a center position interconnecting and permitting flow freely between all of the ports into two position end postions in one of which the high-pressure source-side port is connected to the one actuator compartment and the low-pressure source-side port is connected to the other actuator compartment and in the other of which the low-pressure source-side port is connected to the one actuator compartment and the high-pressure source-side port is connected to the other actuator compartment,

the valve being so constructed and arranged that on displacement between either end valve position and the center valve position the flow through the valve between the source and the actuator is smoothly and regularly varied from maximum flow in the end valve positions to no flow in the center valve position;

reversible operating means for urging the valve body alternatively out of one or the other of its end positions; and

link means connected between the actuator and the valve body for displacing the valve body at least as the element nears either of its end positions from the respective end valve position to the center valve position and for retaining the valve body in the center position until the operating means reverses, the end positions of the valve body and controlled element being so oriented that displacement of the controlled element by the external force out of either of its end positions displaces the valve body in a direction applying pressure to the compartments to correct the externally applied displacement.

4,627,329

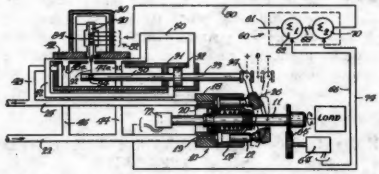
POWER DRIVE UNIT AND CONTROL SYSTEM THEREFOR

William G. Durtschi, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 19, 1984, Ser. No. 633,211

Int. Cl.[4] F01B *3/10, 13/04*

U.S. Cl. 91—506 **2 Claims**



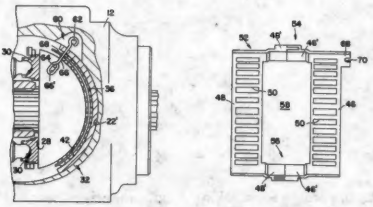
1. An electro-hydraulic control system for a power drive unit having a wobbler-controlled variable displacement hydraulic motor wherein the control system causes the displacement of the hydraulic motor to match a load to be driven by a power drive unit output shaft coupled to said motor, said system comprising: electro-hydraulic servo means operatively associated with said wobbler for control of the position of the wobbler including a servo cylinder with a servo piston associated with a reciprocal link connected to said wobbler and an electrically operable valve member for applying a differential pressure to said servo piston, signal summing means electrically coupled to said electro-hydraulic servo means and responsive to an input command signal and one or more signals representative of speed and/or position of said power drive unit output shaft for generating a control signal applied to said electrically operable valve member of said electro-hydraulic servo means, summing means at the electro-hydraulic servo valve for summing said control signal with the actual position of the wobbler for controlling the position of the wobbler by applying a force to said electrically operable valve member representative of wobbler position, and an extension of said link directly connected to said electrically operable valve member for indicating to said summing means the actual position of said wobbler by linear movement thereof.

4,627,330

UNITARY BEARING RETAINER FOR A SWASHPLATE BEARING

Richard Beck, Jr., Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 11, 1984, Ser. No. 680,438
Int. Cl.[4] F01B *13/04*
U.S. Cl. 92—12.2 18 Claims



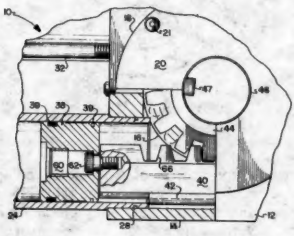
1. A variable displacement hydraulic unit comprising a housing, a cylinder block mounted in said housing for rotation about an axis, said cylinder block having a plurality of axial cylinders therein each containing a reciprocating piston, a swashplate for controlling the displacement of said pistons within said cylinders, a rotatable shaft connected to said cylinder block and extending along said axis through an opening formed in said swashplate, support means for tiltably supporting said swashplate in said housing, and positioning means for controlling the tilt of said swashplate relative to said housing, said support means comprising at least two spaced apart sets of rollable bearing elements positioned between said swashplate and said housing with said shaft extending between said at least two of said sets of bearing elements, means constraining said bearing elements to a rolling motion in a generally arcuate path, said constraining means including a unitary bearing cage assembly for retaining said bearing elements of at least two of said sets.

4,627,331

ROTARY ACTUATOR HAVING CAST PISTON AND ARCUATE RACK BEARING

Julius Fejes, Orrville, Ohio, assignor to Flo-Tork, Inc., Orrville, Ohio

Filed May 31, 1985, Ser. No. 740,017
Int. Cl.[4] F16J *1/10*
U.S. Cl. 92—129 4 Claims



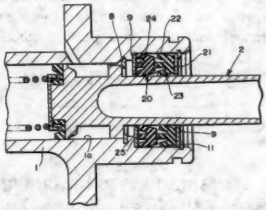
1. A rotary actuator having
(a) a housing having a longitudinally extending bore therein;
(b) a pair of cylinders axially aligned with said bore, the inside diameter of said cylinders being less than the diameter of said bore;
(c) a rack reciprocable in said cylinders;
(d) a pair of floating pistons and means for securing said pistons to said rack at the opposite ends thereof;
(e) a floating rack bearing having an arcuate outer surface conforming to the curvature of said bore, said outer surface being larger in diameter than the inside diameters of said cylinders, and a concave curved inner surface which abuts said rack,
(f) said rack having a longitudinally extending recess for said rack bearing, said recess and the inner surface of said rack bearing being complementary in shape, said recess being formed by a recessed curved outer wall portion, said outer wall portion and the inner surface of said rack having the same curvature and width and being in abutting relationship.

4,627,332

SEALING MEMBERS FOR MASTER CYLINDERS

Youichi Furuta, and Chiaki Ochiai, both of Chiryu, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Feb. 9, 1984, Ser. No. 578,692
Claims priority, application Japan, Mar. 31, 1983, 58-45794[U]
Int. Cl.[4] F16J *15/18*
U.S. Cl. 92—168 2 Claims



1. An annular sealing member assembly to be disposed in an annular space defined by the inner wall of a cylindrical bore, the outer wall of an operating piston axially movable in said bore, and a pair fixed, axially-spaced annular surfaces, said assembly comprising at least two sealing members, each said sealing member including an annular base portion, an outer annular lip portion integrally formed on said base portion for sealing engagement with said inner wall, an inner annular lip portion integrally formed on said base portion for sliding and sealing contact with said outer wall, and an annular rib portion integrally formed on said base portion radially between said lip portions, said rib portion axially extending in the same direction as and for a distance greater than said lip portions and having a plurality of radially-extending slots permitting uniform distribution of fluid between the peripheries of said sealing member, wherein said sealing members in said assembly are axially abutting and so oriented that the base portion of one sealing member abuts one said annular surface, the base portion of the other sealing member abuts the end of the rib portion of said one sealing member, and the end of the rib portion of the other sealing member abuts the other annular surface.

4,627,333

STORAGE STRUCTURE

Thomas H. Anderson; Donald E. Anderson, both of 1833 S. Holland Sylvania Rd., Maumee, Ohio 43537; Glenn E. Hall, and Roy W. Blanton, both of Toledo, Ohio, assignors to The Andersons, Maumee, Ohio

Filed Nov. 27, 1984, Ser. No. 675,207
Int. Cl.[4] A01F *25/08*
U.S. Cl. 98—56 17 Claims

1. An improved storage assembly for storing a particulate material, said storage assembly comprising, in combination,
a vertically extending chute having vertically spaced openings;
a cap assembly surrounding said vertically extending chute

and mounted for movement on said vertically extending chute;

a cover having its upper end operatively attached to said cap assembly; and

a ring assembly vertically movable on said cap assembly and engaging said cover, whereby said ring assembly may be vertically moved relative to said cap assembly, said cover being tensioned by said ring assembly retarding the formulation of circumferential folds in said cover during loading.

6. An improved storage assembly according to claim 1, wherein said cap assembly surrounds said vertically extending chute, said cap assembly defining a plurality of spaced openings, said openings defining a fluid flow path with the interior of said cover, and valve members mounted adjacent said spaced openings, whereby one or more valve members may be moved to establish such fluid flow path to the interior of said cover.

4,627,334

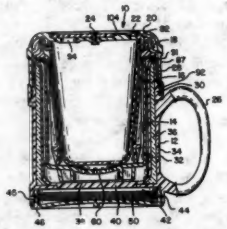
PORTABLE, NESTABLE BEVERAGE BREWING SYSTEM

William C. Shanklin, 4105 N. 39th, Tacoma, Wash. 98407

Filed Dec. 3, 1985, Ser. No. 804,685

Int. Cl.[4] A47J *31/02*

U.S. Cl. 99—306 **22 Claims**



1. A portable, nestable beverage brewing system comprising:

a water receiving vessel;

a filter holder having first and second ends, said first end being sized to detachably engage said water receiving vessel during the brewing of said beverage, said filter holder being adapted to retain a filter between said filter holder and said water receiving vessel;

a brewed beverage receiver sized to detachably engage said second end of said filter holder during the brewing of said beverage, said brewed beverage receiver also being sized to receive and retain therein said water receiving vessel and filter holder;

a powdered beverage storage canister sized for receipt within said brewed beverage receiver after the receipt of said water receiving vessel and filter holder within said brewed beverage receiver; and

locking means for maintaining said water receiving vessel, filter holder, and powdered beverage storage canister within said brewed beverage receiver.

4,627,335

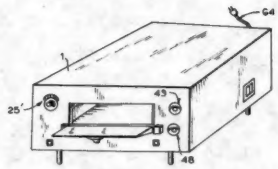
APPARATUS FOR COOKING FOOD

Victor Sherman, 13-10 34 Ave., Long Island City, N.Y. 11106; Ilya Zborovsky, 3285 Wolfson Dr., Baldwin, N.Y. 11510, and William Sanchez, 35-69 169 St., Flushing, N.Y. 11358

Filed Nov. 26, 1985, Ser. No. 801,781

Int. Cl.[4] A47J *37/00*

U.S. Cl. 99—325 **10 Claims**



1. An apparatus for cooking food, comprising at least two solid plates, at least one of said plates being movable relative to the other plate so that an initial food material can be directly contacted by said plates from both sides; means for heating said plates to a high temperature; means for acting on at least said one plate and including driving means for driving said one plate into movement toward said other plate so as to develop in the initial food material a high pressure, so that cooking is performed not only under the action of the high temperature, but also under simultaneous action of the high pressure which increases the temperature of evaporation of liquid matter from the initial food material; and means for adjusting the pressure in the initial food material in dependence on the nature of the initial food material, said adjusting means including a sensing element which senses at least one parameter of the movement of said one plate and when said parameter reaches a value corresponding to said pressure in the initial food material said sensing element switches off said driving means so as to stop said one plate.

4,627,336

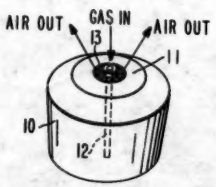
APPARAUTS FOR STORAGE OF PERISHABLES

Kang H. Nam, 15634 E. Amar Rd., #E, La Puente, Calif. 91744

Filed Sep. 25, 1985, Ser. No. 779,921

Int. Cl.[4] B65D *81/20, 51/16*

U.S. Cl. 99—467 **1 Claim**



1. An assembly for storage of perishables, comprising, in combination, a circular pot for containing said perishables, and a housing supporting said pot; said pot including a removable lid thereupon, a vertical tube through a center of said lid extending into a lower portion of an interior of said pot for entry of inert gas thereinto, a circular vent opening through said lid surrounding said tube concentrically, and a screen means extending across said vent opening for centrally securing said tube to said lid; and said housing including a base upon which said pot is placed, an inert gas tank inside said base, said housing including a roof parallel to said base and spaced above said pot, a tube connected to the roof for connecting to said vertical tube, a channel inside said roof, one end of said channel being connected to said tube connected to said roof, and the other

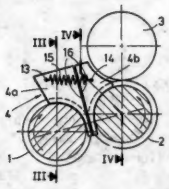
end of said channel being connected to said inert gas tank for said gas to travel from said tank to said pot.

4,627,337

LEAK-RESISTANT FEEDING CHAMBER FOR CHOCOLATE REFINING MACHINES

Sergio Ripani, and Giulio Serafini, both of Milan, Italy, assignors to Carle & Montanari S.p.A., Italy

Filed Apr. 15, 1985, Ser. No. 723,318
Claims priority, application Italy, May 10, 1984, 20861 A/84
Int. Cl.[4] B02C *25/00*
U.S. Cl. 99—485 13 Claims



1. A leak-resistant feeding chamber for feeding chocolate paste to a chocolate refining machine, comprising:

(a) a pair of feeding rolls each elongated along, and rotatable about, different longitudinal axes of rotation,

(b) one of the feeding rolls having a cylindrically elongated first main portion of a predetermined diameter, a cylindrical first end portion at one end region of the first main portion, and a cylindrical second end portion at an opposite end region of the first main portion, each end portion of the one feeding roll having a diameter less than said predetermined diameter of the first main portion,

(c) the other of the feeding rolls having a cylindrically elongated second main portion of a predetermined diameter, a cylindrical first end portion at one end region of the second main portion, and a cylindrical second end portion at an opposite end region of the second main portion, each end portion of the other feeding roll having a diameter less than said predetermined diameter of the second main portion,

(d) said first and second main portions longitudinally engaging and juxtaposed with each other, and having conveying surfaces which convey chocolate paste to the machine during rotation of the feeding rolls, said conveying surfaces bounding a base for the feeding chamber,

(e) a pair of upright first end walls respectively mounted on, and transversely spanning between, the first end portions of the feeding rolls, and together bounding one end for the feeding chamber,

(f) a pair of upright second end walls respectively mounted on, and transversely spanning between, the second end portions of the feeding rolls, and together bounding an opposite end for the feeding chamber,

(g) said first end walls sealingly engaging each other to resist chocolate paste from escaping from the feeding chamber at said one end thereof, and

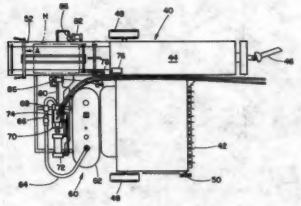
(h) said second end walls sealingly engaging each other to resist chocolate paste from escaping from the feeding chamber at said opposite end thereof.

4,627,338

APPARATUS FOR THE TREATMENT OF RUMINANT FORAGE MATERIAL OR SOIL

David J. Sprott, Lansing, and C. Alan Rotz, Haslett, both of Mich., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 561,393, Dec. 14, 1983. This application Sep. 12, 1985, Ser. No. 775,949
Int. Cl.[4] A23K *1/22*
U.S. Cl. 99—534 20 Claims



1. An apparatus for protecting a formed bale of tightly compacted, interwoven fibrous material with a liquid preservative; comprising a bale platform for receiving the formed bale along a predetermined path; storage means for a supply of said liquid preservative; means for withdrawing a quantity of said liquid preservative from said storage means; means for pressurizing said withdrawn liquid preservative; injection valve means for receiving a quantity of said pressurized liquid preservative from said pressurizing means; said valve means including at least one jet spray discharge orifice located closely adjacent said predetermined path of dispense a high pressure jey spray of the pressurized liquid preservative through an outside surface of the baled material and into the interior thereof to vaporize and disperse the liquid preservative throughout the baled material; and control means for actuating said valve means to eject said pressurized liquid preservative from said discharged orifice.

4,627,339

APPARATUS FOR REMOVING SKINS AND PITS FROM AVOCADOS AND THE LIKE

Ronald C. Bushman, Hacienda Heights, Calif., assignor to Brown International Corporation, Covina, Calif.

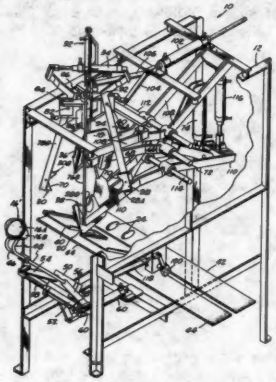
Filed Dec. 18, 1984, Ser. No. 682,832
Int. Cl.[4] A23N *4/00, 7/00*
U.S. Cl. 99—540 18 Claims

1. Apparatus for removing skins and pits from avocados and the like, comprising:

knife means for cutting through the skin and flesh of an avocado and for engaging and holding the avocado pit,

jaw means for engaging the avocado skin on opposite sides

of the knife means and removing it from the avocado flesh, and



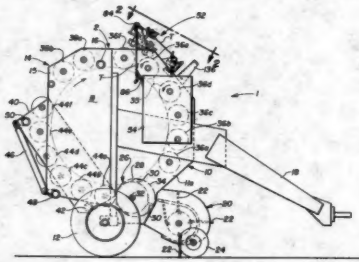
stripper means for separating flesh portions of the avocado from the pit while the pit is engaged and held by said knife means.

4,627,340

TWINE WRAPPING APPARATUS WITH TRIP MECHANISM ACTUATED TWINE DISPENSING MEMBER

Emmett F. Glass, Akron, and Robert A. Wagstaff, Lancaster, both of Pa., assignors to New Holland Inc., New Holland, Pa.

Filed Oct. 16, 1985, Ser. No. 787,880
Int. Cl.[4] B65B *13/18*
U.S. Cl. 100—5 **3 Claims**



1. In a roll baling machine having means for forming crop material into roll bales, and apparatus for wrapping the roll bales with twine, said apparatus comprising:

a twine dispensing arm mounted for pivoting movement to dispense twine;

clamp means for clamping the twine dispensed by said twine dispensing arm, said clamp means including a stationary jaw member and a movable jaw member, said jaw members having end portions defining a mouth therebetween for receiving the twine, said movable jaw having a closed position wherein twine is clamped between said jaw members and an open position wherein twine is released from said jaw members, said clamp means also including a stationary knife disposed adjacent said mouth for severing the twine; and

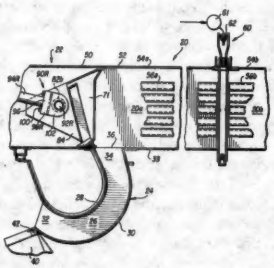
trip means connected to said clamp means, said trip means being actuated by said twine dispensing arm during its pivoting movement to release the twine from said clamp means, said trip means including a control rod connected at one end to said movable jaw member, said trip means also including a pin movably mounted on the other end of said control rod for engagement with said twine dispensing arm, said pin being movable from a trip position to an actuating position for actuating said control rod in order to move said movable jaw member into said open position, said pin also being movable from said trip position to a non-actuating position without actuating said control rod so that said movable jaw member remains in said closed position, said trip means further including a spring urging said pin into said trip position, said pin being moved from said trip position to said actuating position when said twine dispensing arm is moving in one direction, and said pin being moved from said trip position to said non-actuating position when said twine dispensing arm is moving in another direction.

4,627,341

BALE DENSITY CONTROL SENSING APPARATUS AND METHOD

Cecil R. Sudbrack; Linwood H. Bowen, both of New Holland, Pa., and Donald O. Bigelow, Webster, N.Y., assignors to New Holland, Inc., New Holland, Pa.

Filed Sep. 6, 1985, Ser. No. 773,471
Int. Cl.[4] B30B *15/26*
U.S. Cl. 100—41 **33 Claims**



18. A method for controlling the density of bales of crop material discharged from an agricultural baling machine, said method comprising the steps of:

introducing crop material into a bale case;

reciprocably driving plunger means disposed in said bale case in a manner whereby said plunger means applies a compactive force to crop material introduced into said bale case, said plunger means being connected to plunger driving means by connecting means comprising a wrist pin mounted on said plunger means and a connecting rod assembly having a first end connected to said plunger driving means and a second end connected to said wrist pin;

sensing the stress experienced by said wrist pin during the application of said compactive force applied by said plunger means and for producing an electrical signal in accordance with said sensed stress; and,

adjusting in response to said signal the degree of resistance to the movement of crop material through said bale case and thereby controlling the density of bales of crop material being discharged therefrom.

4,627,342

HEATED SLEEVE PRINTING ROLL COUPLE WITH CLUTCH-BRAKE UNIT CONTROL

Katsufumi Yui, Saitama, Japan, assignor to E.D.M. Corporation, Tokyo, Japan

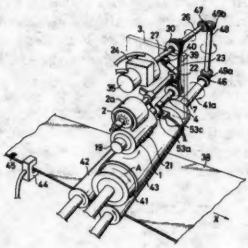
PCT No. PCT/JP84/00461, § 371 Date Jan. 22, 1986, § 102(e) Date Jan. 22, 1986, PCT Pub. No. WO86/01774, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 27, 1984, Ser. No. 759,431

Claims priority, application Japan, Sep. 13, 1984, 59-139115; Sep. 13, 1984, 59-139116; Sep. 13, 1984, 59-139117

Int. Cl.[1] B41F *1/07*

U.S. Cl. 101—25 3 Claims



1. A printer comprising a printing roll mounted on a main shaft, means for effecting rotation of said printing roll main shaft, an ink roll presented in axial parallel relationship to said printing roll and provided with heat-soluble ink, a clutch-brake unit operatively connected to said printing roll and said ink roll for controlling rotation thereof consonant with the printing interval of material to be printed, an encoder for translating the rate of feed of said material to be printed into a pulse of unit length, said printing roll rotatable cooperatively with said clutch-brake unit, a heat sleeve concentrically disposed upon said main shaft for rotation therewith, a heater element provided within said heat sleeve for heating thereof and being fixedly mounted whereby said sleeve will rotate relatively thereto, a printing type holder removably mounted on the outer periphery of said heat sleeve and printing type carried on said holder for receiving ink from said ink roller for application upon the material to be printed.

4,627,343

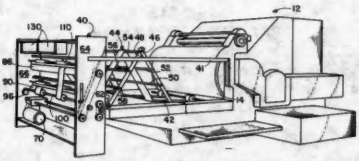
CYLINDER PRESS CONVERSION FOR HOT DIE APPLICATION OF FOIL

Dirk Liepelt, deceased, late of Cornelius, Oreg. (by Joan A. Liepelt, personal representative), assignor to Liepelt & Son, Inc., Hillsboro, Oreg.

Filed Jun. 11, 1985, Ser. No. 743,375

Int. Cl.[4] B41F *3/18*

U.S. Cl. 101—27 16 Claims



1. Apparatus usable in conjunction with a cylinder press having a cylinder and a reciprocatingly movable chase carrying a die, for hot die stamping of foil onto stock carried on the cylinder of the press, the apparatus comprising:

(a) supply means mounted on said chase for holding ready a supply of foil-carrying material;

(b) foil draw means fixedly located with respect to said press and separate from said chase, for periodically pulling foil-carrying material from said supply through a predetermined position with respect to said chase, said foil draw means being fixedly located with respect to said press;

(c) foil support means for controlling the location of said foil-carrying material and keeping a portion of said foil-carrying material located between said supply means and said foil draw means from coming into unintended contact with a die carried on said chase during reciprocating movement of said chase, said foil support means including a first longitudinal member pivotably attached to said chase and a second longitudinal member pivotably attached to said foil draw means, said first and second longitudinal members being pivotably connected with one another at a hinge joint located intermediate said chase and said foil draw means;

(d) transverse horizontal crossbar means located proximate to said hinge joint, for supporting said foil-carrying material clear of said hot die during said reciprocating movement of said chase; and

(e) draw control means for adjustably controlling the distance through which said foil draw means pulls said foil-carrying material.

4,627,344

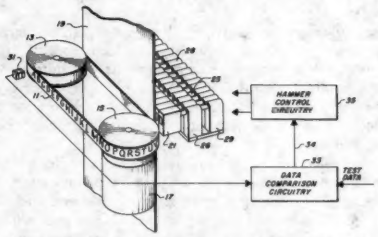
IMPACT PRINTER WITH MAGNETIC INTERACTION COMPENSATION

Robert E. Costello, Utica, Mich., assignor to Centronics Data Computer Corp., Hudson, N.H.

Filed Apr. 11, 1985, Ser. No. 721,994

Int. Cl.[4] B41J *1/20*

U.S. Cl. 101—93.14 7 Claims



1. In a high speed impact printer in which a plurality of magnet coils are arranged in an array and are energized repeatedly in varying patterns thereby to effect printing, a compensation system for magnetic interaction between the coils comprising:

for each coil, a respective input circuit which may be actuated to represent that the coil is to be energized on the current print cycle;

for each coil, means for providing a delay which is of programmable duration;

for each coil, means for energizing the respective coil at the completion of the respective delay;

for each coil, logic means responsive to the state of the respective input circuit and to the states of the input circuits for physically adjacent coils for programming the respective delay means to a delay value which is a predetermined logical function of said states, whereby interaction effects between said coils may be offset by varying delays.

4,627,345

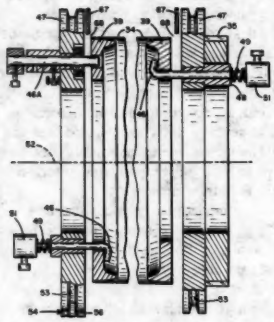
ROTARY SCREEN PRINTING APPARATUS

John D. Watts, Newtown, Conn., assignor to Lockwood Technical, Inc., Monterey, Calif.

Continuation of Ser. No. 581,548, Feb. 21, 1984, abandoned. This application Dec. 10, 1984, Ser. No. 679,996

Int. Cl.[4] B41L *13/06, 23/20*

U.S. Cl. 101—119 **32 Claims**



21. A rotary screen printing device for delivering heated coating fluid from the inside of a thin-walled heated print cylinder, having a longitudinal central axis, through patterned openings formed therein onto an adjacent advancing substrate, comprising:

a base frame;

a print cylinder support frame mounted on the base frame incorporating interconnected upstanding side members, having respective outer faces and facing inner faces;

a plurality of minor idlers mounted for rotation in a plane substantially perpendicular to the longitudinal central axis near the inner face of each side member, and respectively positioned at equal distances from the longitudinal central axis;

a pair of ring-shaped major idlers having their periphery retained in rolling contact with and supported by the minor idlers near each side member for rotation about the longitudinal central axis, at least one major idler having a driven gear attached thereto on a side toward the inner face of an upstanding side member in spaced relation thereto;

a thin-walled print cylinder having patterned fluid delivery openings formed therein, and a pair of end rings, each secured in telescoped relationship inside one end of the print cylinder and thereby maintaining it in a relatively rigid tubular configuration, the total length of said print cylinder and said pair of secured end rings being less than the distance between the inner faces of said major idlers;

a plurality of cylinder tensioning devices attached to each of said major idlers and respectively connectable to each of said end rings, said tensioning devices having resilient mountings providing outwardly directed tension to said print cylinder along the longitudinal axis while maintaining space between each of said end rings and respective major idlers;

an impression cylinder support frame mounted on the base frame, and an impression cylinder affixed to a rotatable shaft rotatively secured to the impression cylinder support frame along a second axis parallel to said longitudinal axis, and means for rotating the shaft;

a drive gear affixed to said rotatable shaft at a position in alignment with said driven gear;

means for causing relative parallel movement between said longitudinal axis and said second axis without causing disengagement of said drive gear and said driven gear;

a liquid delivery manifold passing inside said print cylinder proximate said longitudinal axis, including means for heating said manifold; and

a radiant heater affixed to said print cylinder support frame, including means for directing radiant heat energy toward the outside of said thin-walled print cylinder; and

a heat shield at least partially enclosing said thin-walled print cylinder and extending to said radiant heater, said heat shield having walls extending into the space between each of said end rings and respective major idlers.

4,627,346

ROTATIVE PRINTING PROCESS AND APPARATUS FOR CARRYING OUT SAID PROCESS

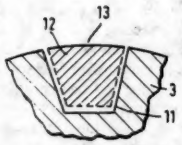
Hans-Peter Dietzell, Rosenheim-Aisingerwies, and Friedrich Kratzert, Stephanskirchen, both of Fed. Rep. of Germany, assignors to Niedermayr Papierwarenfabrik AG, Rosenheim, Fed. Rep. of Germany

Continuation of Ser. No. 627,348, Jul. 3, 1984, abandoned, which is a continuation of Ser. No. 581,210, Feb. 22, 1984, abandoned, which is a continuation of Ser. No. 338,937, Jan. 12, 1982, abandoned. This application Feb. 18, 1986, Ser. No. 830,712

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1981, 3101243

Int. Cl.[4] B41M *1/10*

U.S. Cl. 101—170 **13 Claims**



1. A rotative printing process which comprises delivering printing ink diluted with a solvent to a rotating cylinder, said cylinder having a cylindrical surface with cups on said surface, said cups receiving said ink, said ink having a viscosity sufficiently low for ready delivery to said cups, and heating the printing ink after it is delivered to said screen cups so as to increase the temperature of the ink while in said cups by an amount sufficient to evaporate a portion of said solvent so as to increase the viscosity of said ink, and removing the ink from the surface of said cylinder between said cups, and transferring the ink only from said cups to a printing carrier to provide distinct points on the printing carrier, each said point corresponding to the ink transferred from one respective cup, said ink being allowed to cool during the transfer from the cups to the printing carrier, the partial evaporation of the solvent serving to minimize point growth on the carrier by increasing the viscosity of the ink.

4,627,347

PRINTING APPARATUS

Orville C. Huggins, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

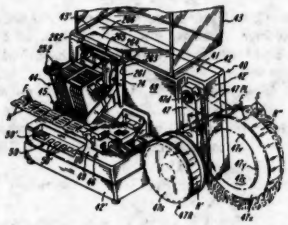
Division of Ser. No. 349,498, Feb. 17, 1982, Pat. No. 4,421,425. This application Feb. 1, 1984, Ser. No. 576,090

Int. Cl.[4] B41F *1/08*

U.S. Cl. 101—292 **7 Claims**

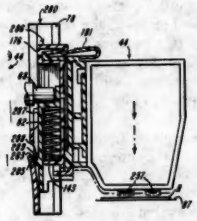
1. Printing apparatus, comprising: a frame, a print head, a platen cooperable with the print head, means including a support mounting the print head for reciprocating movement to the frame, means for feeding a web of record members to a printing position between the print head and the platen, a

cover guarding the user from the print head and the feeding means, a hinge having a first portion connected to the cover



and a second portion secured by being captive between the frame and the support.

4,627,348
PRINTING APPARATUS
Orville C. Huggins, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Division of Ser. No. 349,498, Feb. 17, 1982, Pat. No. 4,441,425.
This application Feb. 1, 1984, Ser. No. 575,969
Int. Cl.[4] B41F *1/08*
U.S. Cl. 101—292 **3 Claims**

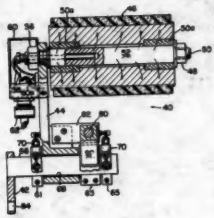


1. Printing apparatus, comprising: a frame, a platen mounted on the frame, a print head movable into and out of printing cooperation with the platen at a printing position, a first mounting member rigidly secured to the frame and having a pair of spaced guides, a second mounting member guided for straight line movement in the guides, a drive member movable back and forth for moving the print head, wherein the first mounting member has an elongated slot and the drive member includes a drive pin movable in the slot, a spring device coupling the drive member and the second mounting member, and means for releasably latching the print head to the second mounting member.

4,627,349
HEATED INKING ROLL FOR A PRINTER
Gary J. Claussen, 3150 King Ave., #4, Billings, Mont. 59102
Filed May 2, 1985, Ser. No. 729,878
Int. Cl.[4] B41F *31/00*
U.S. Cl. 101—348 **14 Claims**

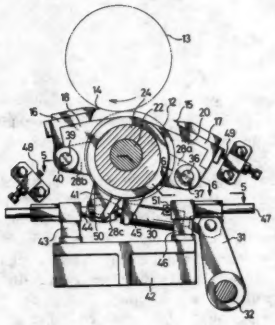
1. Apparatus for applying ink to a printing element such as a grade stamp, which comprises:

means for supporting an associated generally cylindrical ink roll for rotational movement and means for heating the associated ink roll, said means for heating being an elongated electric resistance heating element disposed within said means for supporting and also within the associated ink roll disposed on said means for supporting, said means for supporting including a bushing through which heat is conducted, said bushing extending in axially overlapping relationship to said elongated elastic resistance heating element and the associated ink roll, and said electric resistance elongated heating element being in substantially



coaxial relationship with said ink roll whereby heat is transferred radially from said electric resistance heating element to the ink roll.

4,627,350
CONVERTIBLE INK SCRAPER DEVICE CORRESPONDING TO REVERSE-ROTATABLE MESH ROLLER
Masayoshi Sato, 76-3, Mukaigaoka, Takatsu-ku, Kawasaki 213; Noritake Harada, 5408-57, Hino, Konan-ku, Yokohama 233, and Kunio Suzuki, 4-11 Ichiba-Shita-machi, Tsurumi-ku, Yokohama 230, all of Japan
Filed Nov. 8, 1983, Ser. No. 549,997
The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.
Int. Cl.[4] B41F *31/00*
U.S. Cl. 101—350 **3 Claims**



1. A convertible ink scraper device corresponding to a reverse-rotatable mesh roller comprising:

a fountain roller for picking up ink from an ink pan;

a mesh roller being spaced slightly from said fountain roller and having minute recesses defined in a peripheral surface thereof;

first and second doctor blades disposed in symmetrical locations one on each side of a position in which said mesh roller is disposed adjacent to said fountain roller, and each said doctor blade having a distal end confronting and pressable against said mesh roller;

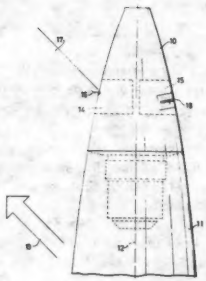
switch means for independently displacing the doctor blades so as to selectively engage either one or neither of said doctor blades with said mesh roller, means for driving said mesh roller in either a normal or reverse direction, said means for driving including clutch means for selectively rotating said mesh roller in either the normal or reverse direction.

4,627,351

FUSE FOR PROJECTILES

Gunnar G. Thordarson, and Sven O. Bidö , both of Järfälla, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 4, 1984, Ser. No. 646,731
Claims priority, application Sweden, Sep. 8, 1983, 8304814
Int. Cl.[4] F42C *13/02*
U.S. Cl. 102—213 7 Claims



1. A device for initiating burst of a projectile which rotates about its length axis and has directive maximum explosive force when the projectile is close to a target, such device comprising:

a first sensor having a narrow sensitivity lobe in a direction oblique to the length axis of the projectile and which is at a predetermined angle with respect to the direction of maximum explosive force of the projectile, such first sensor delivering a pulse-shaped signal signifying target detection each time it is directed towards the target during the rotation of the projectile;

a second sensor adapted to monitor the distance to the target and to deliver a pulse-shaped signal when the projectile has entered a predetermined distance zone from the target, such second sensor having a limited sensitivity lobe in a direction oblique to the length axis of the projectile and which is at a predetermined angle with respect to the sensitivity lobe of the first sensor, the signal produced thereby being phase displaced with respect to the signal produced by the first sensor;

an ignition circuit for igniting the projectile;

a coincidence circuit connected to both sensors for supplying an ignition signal to the ignition circuit to cause it to ignite the projectile in response to concurrent signals from both sensors; and

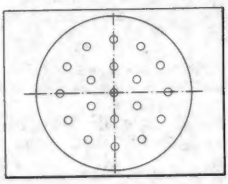
means for comparing the phase of the pulse signals of both sensors and applying them to the coincidence circuit only when such signals are at a predetermined phase relative to each other, whereby only concurrent signals at said predetermined phase can cause the coincidence circuit to supply an ignition signal to the ignition circuit.

4,627,352

SINGLE- OR MULTIPLE-BASE POWDER CHARGES FOR PROPELLANTS AND PROCESS FOR THEIR MANUFACTURE

Heinrich Brachert, Troisdorf-Oberlar; Dieter Girke, Troisdorf, and Gerd Kellner, Aresing, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 47,862, Jun. 13, 1979, abandoned, which is a continuation of Ser. No. 796,870, May 16, 1977, abandoned, which is a continuation of Ser. No. 685,393, May 10, 1976, abandoned. This application Feb. 17, 1984, Ser. No. 611,165
Claims priority, application Fed. Rep. of Germany, May 10, 1975, 2520882; Aug. 5, 1975, 2534898
Int. Cl.[4] C06B *45/00*
U.S. Cl. 102—290 19 Claims



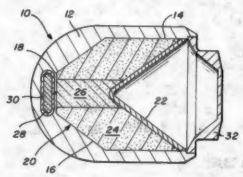
1. A single- or multiple-base powder charge for propellants having at least one internal cavity formed therethrough, which comprises at least one powder grain in the form of a shaped mass of powder, the diameters of the internal cavities of the powder grains constituting said propellant charge being different and at least a portion thereof being smaller than the critical diameter pertaining to the ignition pressure and governing the penetration of the ignition flame into the internal cavities; and at least a portion of the internal cavities being ignited with a retardation only with gas pressures rising above the ignition pressure; at least the predominant portion of the internal cavities having diameters that are present in a predetermined distribution of from about 10 to 250μ.

4,627,353

SHAPED CHARGE PERFORATING APPARATUS

Manmohan S. Chawla, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 25, 1985, Ser. No. 791,634
Int. Cl.[4] F42B *1/02*
U.S. Cl. 102—307 2 Claims



1. An explosive shaped charge comprising:

a housing having a forwardly opening cavity formed therein;

a quantity of explosive material within said cavity, said quantity of explosive material comprising first and second explosive materials having different detonation rates wherein said first explosive material comprises an explosive material having a relatively fast detonation rate, said detonation rate in a range exceeding approximately 8,500 meters/second and wherein said second explosive mate-

rial comprises an explosive material having a relatively slow detonation rate said detonation rate in a range below approximately 8,000 meters/second;

a liner cooperatively arranged to retain said explosive material in said cavity.

4,627,354

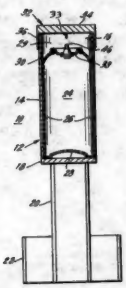
LAUNCHABLE AEROSOL GRENADE

George B. Diamond, Anthony & Woodglen Rds., Glen Gardner, N.J. 08826, and Ralph H. Helmrich, Glen Gardner, N.J., assignors to George B. Diamond, Glen Gardner, N.J.

Filed Sep. 13, 1984, Ser. No. 649,982

Int. Cl.[4] F42B *27/06*

U.S. Cl. 102—368 **14 Claims**



1. A projectile for delivering a quantity of pressurized material to a target area and for dispersing said material at the target area, said projectile comprising:

a sealed can containing said quantity of pressurized material;

a hollow housing having a rear region and a front region which leads said rear region, said can being rearwardly and slidably positioned within the hollow of said housing, said can being sized relative to said housing for being retained rearwardly in said housing prior to impact and for being adapted to slide forwardly toward said front region when said can impacts the target area;

exit means in said can for allowing said pressurized material to exit from said can; and

actuating means on said housing for actuating said exit means to allow said pressurized material to exit from said can into said housing when said can slides toward said front region of said housing.

4,627,355

JOINT RELEASE MECHANISM

James E. Gause, Severna Park, and Ronald E. Armiger, Millersville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1984, Ser. No. 622,298

Int. Cl.[4] F42B *15/10*

U.S. Cl. 102—378 **11 Claims**

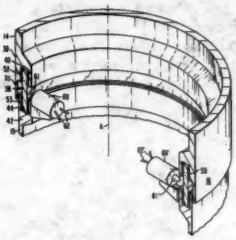
1. A joint release mechanism comprising:

(A) a first cylindrical body portion having a longitudinal axis and an outer surface;

(B) a second cylindrical body portion coaxially arranged with respect to said first cylindrical body portion and having an outer surface;

(C) a cylindrically shaped member of frangible material affixed to both said first and second cylindrical body portions to secure them in position relative to one another and being entirely within the confines of said outer surfaces of said first and second cylindrical body portions; and

(D) plunger means positioned behind said frangible material and being entirely within the confines of said outer surfaces of said first and second cylindrical body portions for



breaking said frangible material whereby said first and second cylindrical body portions may separate.

4,627,356

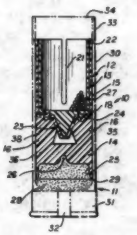
TWO-PIECE BOOSTER SHOT SHELL WAD

Louis Buczkowski, 1332 E. Seventh St., Erie, Pa. 16503

Filed Jun. 11, 1985, Ser. No. 743,620

Int. Cl.[4] F42B *7/08*

U.S. Cl. 102—453 **11 Claims**



1. In combination, a shell case and a two-piece booster shot shell wad comprising a shell case, a one-piece wad, a shot cup,

said one piece wad having a concave over powder wad,

a shot cup container,

resilient pillars,

said pillars connecting said shot cup container to said over powder wad,

said shot cup container having a disk like bottom and cylindrical side walls terminating at a flared rim,

said shot cup having a disk like bottom resting on said disk like bottom of said shot cup container,

said shot cup having generally cylindrical side walls and an open top defining a hollow cylindrical cup having a rim terminating generally flush with said flared rim of said shot cup container,

said shot cup side walls extending from said rim at said upper end downwardly and terminating at said disk like bottom of said shot cup container and having axial slots dividing said side walls into spaced segments.

4,627,357

AMMUNITION PROJECTILE

Pranas Gobis, 6849 Vernon, Dearborn Heights, Mich. 48127

Filed Sep. 27, 1984, Ser. No. 654,971

Int. Cl.[4] F42B *11/00*

U.S. Cl. 102—503 **5 Claims**

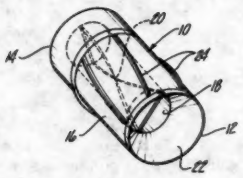
1. An ammunition projectile comprising

an elongated cylindrical body having an axis and an axial cylindrical throughbore,

a helical fin contained within said throughbore for spinning

said body about its longitudinal axis during flight of said body, said helical fin being angled to spin said body in a first rotational direction during flight;

a plurality of exterior fins, said exterior fins being secured to and circumferentially spaced around an outer periphery of said body, said exterior fins being angled with respect to the axis of said body so that said exterior fins spin said body in said first rotational direction during flight,



wherein said body has a forward end and a rearward end, wherein said throughbore flares outwardly from a position spaced inwardly from said forward end and to said forward end of said body to form a conical surface, and wherein said helical fin extends only between said rearward end of said body and said inwardly spaced position.

4,627,358

CONTINUOUS ACTION TRACK LEVELING, LINING AND TAMPING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

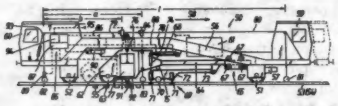
Continuation-in-part of Ser. No. 498,261, May 26, 1983, Pat. No. 4,596,193. This application May 10, 1984, Ser. No. 609,026

Claims priority, application Austria, Sep. 9, 1982, 3386/82; Dec. 16, 1983, 4407/83

The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.[4] E01B *29/17*

U.S. Cl. 104—7.2 **38 Claims**



1. A mobile machine for leveling, lining and tamping a track consisting of two rails fastened to successive ties resting on ballast, which comprises

(a) an elongated, heavy, bridge-like main frame supported on two undercarriages spaced apart for continuous movement in an operating direction,

(b) drive means for continuously advancing the main frame along the track in the operating direction,

(c) an operator's cab, a power plant and operating control means on the main frame,

(d) a lighter subframe means arranged between the two undercarriages and leading one of the undercarriages in the operating direction,

(e) tamping means mounted on the subframe means for tamping ballast in intermittent tamping cycles under respective ones of the ties at points of intersection of the two rails and the respective ties,

(f) track lifting and lining means associated with the two rails mounted on the subframe means ahead of the tamping means at a fixed distance therefrom and sufficiently spaced from the undercarriages in the operating direction to permit leveling and lining of the track,

(1) the tamping, lifting and lining means being arranged within sight of the operator's cab, and

(g) a drive connecting the lighter subframe means to the heavy main frame for adjusting the position of the subframe means in relation to the main frame in the operating direction,

(1) the drive means of the main frame and the drive for the subframe means being synchronized whereby the subframe means may be held stationary intermittently with the tamping, lifting and lining means during each one of the tamping cycles while the main frame is advanced continuously, and

(2) the power plant delivering power to, and the operating control means controlling, the drive and the tamping, track lifting and lining means.

4,627,359

METHOD FOR THE RENEWAL OF A RAILROAD SWITCH OR CROSSING AND TRAIN FOR CARRYING OUT THE METHOD

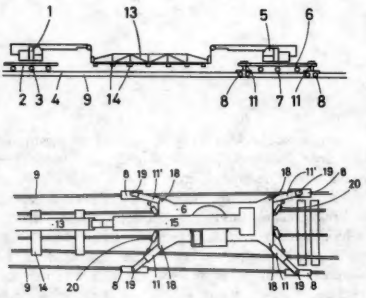
Fritz Bühler, Ecublens, Switzerland, assignor to Les Fils d'Auguste Scheuchzer, S.A., Lausanne, Switzerland

Filed Dec. 18, 1984, Ser. No. 683,184

Claims priority, application Switzerland, Dec. 20, 1983, 6768/83

Int. Cl.[4] E01B *29/02*

U.S. Cl. 104—3 **9 Claims**



1. A train for carrying out the renewal of a switch or crossing in a track, comprising first and second chassis, each having running gear comprising bogies for running on standard gauge track, said two chassis being spaced apart from one another a distance greater than the track-wise extent of a switch or crossing to be renewed, a girder disposed between said chassis and extending lengthwise of the track, a first crane on said first chassis supporting a first end of said girder, a second crane on said second chassis supporting a second end of said girder, and means on said girder for gripping a switch or crossing to be renewed, support means on at least one of said chassis for running along side rails disposed on both sides of said switch or crossing, said means for running on said side rails being also adaptable for running on standard gauge track when transporting a railroad switch or crossing to increase the stability of the crane on said chassis during such transport.

4,627,360

MOBILE TRACK LEVELING, LINING AND TAMPING MACHINE

Josef Theurer, Vienna, and Johann Hansmann, Klosterneuburg, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H, Vienna, Austria

Filed Jun. 7, 1984, Ser. No. 618,121

Claims priority, application Austria, Oct. 5, 1983, 3534/83

The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.[4] E01B *29/17*

U.S. Cl. 104—7.2 **10 Claims**

1. A mobile machine for leveling, lining and tamping a track consisting of two rails fastened to successive ties resting on

ballast, the machine being adapted for use in tangent and switch track sections, which comprises

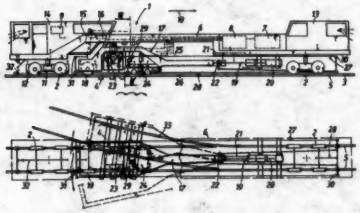
(a) a machine frame supported on undercarriages for continuous movement in an operating direction,

(b) a power plant and operating control means carried by the machine frame,

(c) a tool carrier frame having a front end and a rear end,

(d) an undercarriage supporting and guiding the tool carrier frame rear end on the track,

(e) tamping means mounted on the tool carrier frame immediately ahead of the undercarriage supporting and guiding the tool carrier frame rear end, the tamping means comprising pairs of tamping tools associated with each rail, the tamping tools being arranged for reciprocation in a plane extending in the direction of the rails and at least some of the tamping tools being laterally pivotal in a plane extending perpendicularly to the plane of reciprocation, and the



tamping means being arranged for tamping ballast in intermittent tamping cycles under respective ones of the ties at points of intersection of the two rails and the respective ties in tangent and switch track sections,

(f) track lifting and lining means associated with the two rails mounted on the tool carrier frame ahead of the tamping means at a fixed distance therefrom in the operating direction and comprising vertically adjustable lifting hooks and flanged lining rollers arranged for engagement with each rail, the track lifting and lining means being arranged on the tool carrier frame between two undercarriages spaced in the direction of the track for lifting and lining the track in tangent and switch track sections,

(g) track leveling and lining reference systems associated with the track lifting and lining means, and

(h) a longitudinally adjustable coupling device pivotally linking the front end of the tool carrier frame to the machine frame, the tool carrier frame having a lateral pivoting range sufficient to pivot and guide the tool carrier frame in switch track sections.

4,627,361

OVERHEAD CABLE TRANSPORT INSTALLATION WITH REGULAR SPACED LOAD SUPPORTING CARRIAGES

Serge Tarassoff, Seyssinet-Pariset, France, assignor to Pomagalski, S.A., France

Filed Jan. 13, 1984, Ser. No. 570,687

Claims priority, application France, Jan. 17, 1983, 83 00749

Int. Cl.[4] B61B *11/00, 1/00*

U.S. Cl. 104—28 **4 Claims**

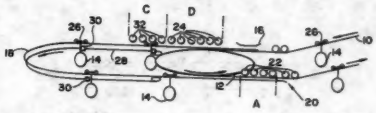
1. An overhead cable transport installation, in particular a gondola lift or a chairlift, comprising:

a continuously moving endless overhead cable extending between two terminals,

a plurality of carriages each supporting a gondola or a chair and having a detachable grip for coupling on said cable,

a transfer rail in each terminal for connecting an inward line and an outward line constituted by said endless cable so as to form with said lines an endless travel path on which the carriages move continuously without stopping, and

a rail section of said transfer rail equipped with a rhythm device, the rhythm device including a first carriage driving means for driving the carriage at slow speed during a first travel time on said rail section, a second carriage driving means for driving the carriage at higher speed during a second travel time on said rail section, said travel times being variable, the length of the first travel time varying inversely with the length of the second travel time so as to change the mean travel speed of said carriage and the whole travel time on said rail section and to monitor the carriage intervals.



4,627,362

AIR SLIDING DEVICE FOR WORK PALLETS OR THE LIKE

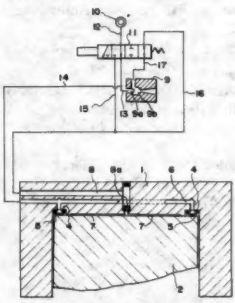
Yoji Ise; Minoru Kato, and Kelichi Tachikawa, all of Tokyo, Japan, assignors to Kabushiki Kaisha Myotoku, Tokyo, Japan

Filed Jun. 20, 1984, Ser. No. 622,730

Claims priority, application Japan, Jun. 28, 1983, 58-116619; Sep. 30, 1983, 58-182249

Int. Cl.[4] B60V *1/11, 1/16;* **B61B** *13/04;* **B61H** *9/00*

U.S. Cl. 104—23.2 **10 Claims**



4. Apparatus for precisely positioning a pallet supporting workpieces, tools and the like comprising

(a) a fixed base member comprising a flat surface and an elongated guide rail having a flat surface,

(b) a pallet having an upper surface for said workpiece, tools and the like slidably mounted on said guide rail and having a lower surface lying in direct opposition to the surface of said base, said pallet being displaceable over said guide rail toward and away from said surface of said guide rail, and

(c) means for feeding air under pressure to the surfaces between said pallet and said guide rail to impose an air cushion therebetween, and

(d) seal means extending about the peripheral edge of the lower surface of said pallet surrounding the space defined between the surface of said guide rail and the lower

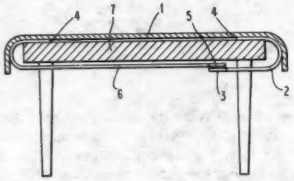
surface of said pallet, and an exhaust port communicating with the space surrounded by said seal means through which a vacuum may be applied causing said pallet to be attracted to said base and said seal means to sealingly enclose said space to hold said pallet in fixed position.

4,627,363

TABLE COVERING APPARATUS

Juliana C. Jones, 1025 Fisk St., Scranton, Pa. 18509

Filed May 10, 1985, Ser. No. 732,602
Int. Cl.[4] A47B *13/08*
U.S. Cl. 108—90 **5 Claims**



1. An apparatus for covering a table in combination with a table comprising

a. a table covering with first and second opposing edges with dimensions accommodatingly larger than the table;

b. a first set of strips attached on one end to the underside of said covering adjacent to the first edge; and aligned with the table edge and extending on the other end outwardly therefrom;

c. a second set of strips attached on one end to the underside of said covering adjacent to the second edge opposing the first edge; and aligned with the table edge and extending, on the other end, outwardly therefrom in a direction opposing said first set for strips and of a length essentially longer than said first set of strips;

d. means for attaching the end of each first strip to the end of each opposing second strip;

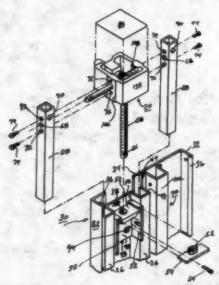
whereby the table is covered and said strips are attached end to end at a location unseen under said table thereby securing the covering thereto while allowing the table covering to drape.

4,627,364

VERTICALLY-ADJUSTABLE DESK STRUCTURE

Thomas A. Klein, Plainwell, and Peter M. Baker, Mattawan, both of Mich., assignors to Lear Siegler, Inc., Kalamazoo, Mich.

Filed Dec. 20, 1985, Ser. No. 811,691
Int. Cl.[4] A47B *9/00*
U.S. Cl. 108—147 **13 Claims**



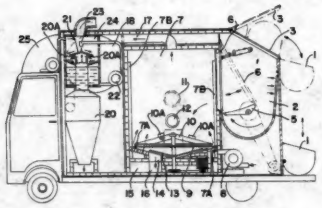
1. In a vertically-adjustable desk having a flat top supported by a leg member having a fixed base portion and an adjustable top portion and means for adjusting said leg member to raise and lower said flat top comprising a driveshaft, a driven shaft, means for turning said driveshaft, an elevator screw threaded into a female screw affixed to said base portion of said leg member, and means for connecting said elevator screw to said driven shaft, whereby rotation of said driveshaft one way raises said top and rotation thereof in the other direction lowers it; the improvement in which the means for affixing said female screw member to the fixed portion of said leg member comprises a flat supporting plate unitarily comprising said female threaded member with the axis thereof normal thereto and horizontally-disposed, plate-supporting means affixed to the fixed base portion of said leg member, said supporting means having a transverse opening therein through which said flat supporting plate can be slid horizontally into said plate-supporting means.

4,627,365

MOBILE GARBAGE INCINERATOR

Kuo-yuan Tseng, No. 287. tzu yu Road, Feng Shan, Taiwan

Filed Sep. 23, 1985, Ser. No. 779,031
Int. Cl.[4] F23G *5/40*
U.S. Cl. 110—240 **5 Claims**



1. A mobile garbage incinerator comprising:

an incinerator unit body;

a hanging drum, located at a back portion of said incinerator unit body, movable to and fro in a vertical direction between a low garbage filling position to a high garbage dumping position;

a hanging drum drive means for lifting or lowering said hanging drum between said low garbage filling position to said high garbage dumping position;

a collecting tank, located adjacent and forward of the hanging drum relative to said incinerator unit body for receiving garbage dumped from said hanging drum;

a pushing plate rotatably mounted within said collecting tank for sweeping and lifting garbage from a bottom of said collecting tank;

a movable cover located above and operatively connected to said collecting tank for opening said collecting tank to receive garbage from said hanging drum and for sealing said collecting tank after a quantity of garbage has been dumped into said collecting tank from said hanging drum for processing;

a movable cover actuating means operatively connected to said movable cover for driving said movable cover;

a main incinerating room, located adjacent and forward of said collecting tank relative to said incinerator unit body;

a first burner operatively connected to said main incinerating room for providing an incinerating flame within said main incinerating room;

an incinerating room door located between said main incinerating room and said collecting tank for pushing trash from said pushing plate into said main incinerating room, for opening said incinerating room to receive garbage from said collecting tank and for sealing said main incinerating room during a first stage incineration of trash delivered to the main incinerating room;

a blower operatively connected to said main incinerating room for providing air for the first stage incineration of garbage and for providing a high positive pressure within said main incinerating room for forcing waste gas from said main incinerating room;

a first tube operatively connected to said main incinerating room for passage of waste gas from said main incinerating room;

a secondary incinerating room operatively connected to said main incinerating room by said first tube;

a second burner operatively connected to said secondary incinerating room for providing an incinerating flame within said main incinerating room;

a second tube operatively connected to said secondary incinerating room for passage of quasi-purified air from said secondary incinerating room;

an air-circulating tank operatively connected to said secondary incinerating room, by said second tube, for separating dust particles from the quasi-purified air including an exit hole for expelling further purified air from said air-circulating tank;

a water curtain located above and surrounding said exit air hole for washing the expelled further purified air; and

an exhaust port for releasing the washed air from the mobile garbage incinerator into the atmosphere.

4,627,366

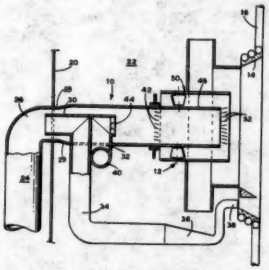
PRIMARY AIR EXCHANGE FOR A PULVERIZED COAL BURNER

Albert D. LaRue, Uniontown; Roger A. Clocker, Wadsworth, and Norman F. Smith, Jr., Doylestown, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 16, 1985, Ser. No. 776,194

Int. Cl.[4] F23D *1/00*

U.S. Cl. 110—263 **11 Claims**



1. A primary air exchange device for a pulverized fuel burner comprising:

a supply line for supplying a combination of primary air and pulverized fuel to a furnace;

separator means secured to said supply line for removing from said supply line a first mixture comprising generally one half of said primary air and a relatively small percentage of said pulverized fuel;

a rich fuel line connected to said supply line for conveying a second mixture comprising the remainder of said primary air and the remaining relatively large percentage of said pulverized fuel past said separator, said rich fuel line forming a burner nozzle for injecting said second mixture into said furnace;

a hot air injector intermediate said furnace and said separator means, for injecting hot air into said rich fuel line for mixing with said second mixture; and,

hot air means connected to said hot air injector for supplying said hot air to said hot air injector.

4,627,367

HOT GAS GENERATION

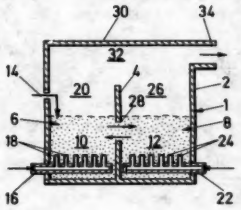
Andrew R. Butt, Quedgeley, England, assignor to Coal Industry (Patents) Limited, England

Filed Nov. 14, 1984, Ser. No. 671,470

Claims priority, application United Kingdom, Dec. 6, 1983, 8332506

Int. Cl.[4] F23D *1/00*

U.S. Cl. 110—347 **10 Claims**



1. A method of generating a hot gas including the steps of establishing a first fluidised bed of particulate material and a second fluidised bed of particulate material adjacent the first fluidised bed, feeding coal to the first fluidised bed, partially gasifying the coal in the said first fluidised bed to generate a combustible gas and char, circulating material in a bi-directional manner between the first and second beds across a mutual boundary, fluidising the material at the boundary during circulation thereof, burning the char in the second fluidised bed to generate oxygen rich gases, mixing the combustible and oxygen rich gases downstream of the first and second beds, and burning the combustible gas in the oxygen rich gases to generate a hot gas product.

4,627,368

EMBROIDERING STATION WITH SCHIFFLI-SHUTTLES

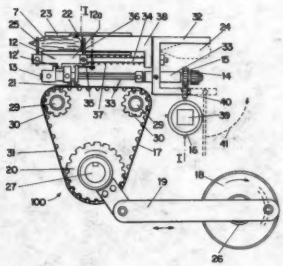
Rudolf Reich, Neuwied, Fed. Rep. of Germany, assignor to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Continuation-in-part of Ser. No. 408,819, Aug. 12, 1982, abandoned. This application Oct. 21, 1985, Ser. No. 789,629

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1981, 3133333

Int. Cl.[4] D05C *3/02, 11/00*

U.S. Cl. 112—83 **9 Claims**



1. An apparatus for selectively driving schiffli-shuttles in embroidering stations of an embroidering machine, comprising:

at least one schiffli-shuttle guideway fixed to a frame member of the embroidering machine to extend in a predetermined direction of extent;

a schiffli-shuttle guided in each said at least one schiffli-shuttle guideway;

stationary longitudinal guide means fixed to said frame member and extending substantially parallel to said predetermined direction of extent of said schiffli-shuttle guideway;

a shuttle driver translatably guided by said stationary longitudinal guide means and provided with coupling means;

barrier means mounted at said shuttle driver and extending substantially transversely into said at least one schiffli-shuttle guideway for entraining and restraining said schiffli-shuttle in said schiffli-shuttle guideway;

rotatable longitudinal guide means journaled in said frame member;

an entrainment coupling translatably guided by said rotatable longitudinal guide means and provided with at least one entrainment means;

means for preventing rotation of said entrainment coupling in relation to said rotatable longitudinal guide means;

said rotatable longitudinal guide means having a first angular orientation in which said coupling means engages said at least one entrainment means and a second angular orientation in which said coupling means disengages from said at least one entrainment means;

a reciprocating drive member engaging said at least one entrainment means for transmitting drive motion through said entrainment coupling and said shuttle driver to said schiffli-shuttle; and

control means for selectively rotating said rotatable longitudinal guide means between said first angular orientation and said second angular orientation.

4,627,369

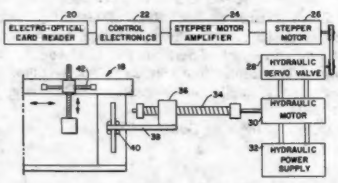
SYSTEM FOR IMPROVING EMBROIDERED ARTICLES

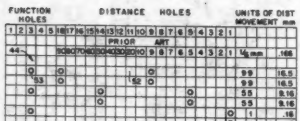
Erich H. Conrad, Asheville; Bernhard Conrad, Weaverville; Robert L. Anderson, and Gilbert E. Carlson, both of Asheville, all of N.C., assignors to Conrad Industries, Inc., Weaverville, N.C.

Filed Jun. 27, 1983, Ser. No. 508,139

Int. Cl.[4] D05C *9/06*; D05B *21/00*

U.S. Cl. 112—103 **4 Claims**





1. A system for improving adjustments of automatically operated embroidery machines having a movable frame comprising:

an elongated tape having a plurality of rows, each row having at least nine predetermined spaces, said tape being of a jacquard type, said spaces adapted to be selectively encoded forming intelligence means on said tape;

a grouping of said intelligence means in each row corresponding to a binary number;

means for reading said binary number from said tape;

means for converting said binary number into electrical pulses;

means for driving the frame of said embroidery machine in the direction and distance in response to said pulses for providing an embroidered stitch;

said intelligence means including holes punched in said tape, the information contained on said tape is substantially equally divided into two sides, one side providing information for frame movement in the X-axis, and the other side providing information for frame movement in the Y-axis;

each side of row having a separate group of holes for forming a separate binary number, the two sides adapted to be read substantially simultaneously whereby the combination of the two numbers dictate the angular direction and distance of the stitch, each side of said tape having at least nine spaces.

4,627,370

SEWING MACHINE DRIVE DEVICE

Takashi Nakamura, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

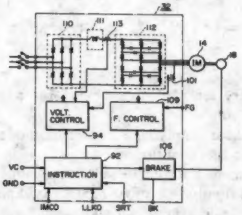
PCT No. PCT/JP82/00326, § 371 Date Apr. 18, 1983, § 102(e) Date Apr. 18, 1983, PCT Pub. No. WO83/00708, PCT Pub. Date Mar. 3, 1983

PCT Filed Aug. 20, 1982, Ser. No. 491,962

Claims priority, application Japan, Aug. 20, 1981, 56/130718; Aug. 20, 1981, 56/130719

Int. Cl.[4] D05B *69/22*

U.S. Cl. 112—275 **3 Claims**

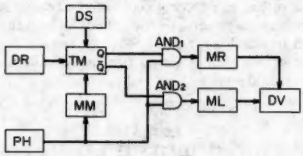


1. A sewing machine drive device comprising a sewing machine drive mechanism having an induction motor and a braking unit; and a position detector connected to the output side of said induction motor, characterized by comprising: a stop position control section, a motor speed detection and control circuit including an inverter circuit, said stop position control section causing said motor speed detection and control circuit to subject said induction motor to variable forward driving, to operate said braking unit with the aid of a detection signal from said position detector, and to reverse the direction of rotation of said induction motor when required, thereby to stop the sewing needle at a predetermined position.

4,627,371
SEWING MACHINE HAVING A STITCH CONTROL DEVICE

Yasukata Eguchi, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 679,019
Claims priority, application Japan, Dec. 9, 1983, 58-231267
Int. Cl.[4] D05B 3/02
U.S. Cl. 112—451 1 Claim

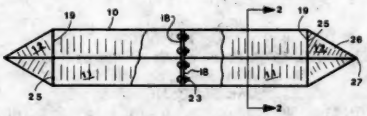


1. A sewing machine for producing stitch patterns in forward and backward fabric feeding directions, the sewing machine comprising an upper drive shaft rotated to vertically reciprocate a needle, the upper drive shaft having a rotation phase in which the needle is moved above a fabric to be sewn; first memory means ML storing stitch control signals including a straight stitch control signal; drive means DV for swinging the needle laterally of the fabric feeding direction, the drive means being responsive to the straight stitch control signal to shift the needle to a predetermined basic needle position; and a stitch control device including second memory means MR storing a swing control signal for swinging the needle laterally of the fabric feeding direction: detecting means PH for detecting the rotation phase of the upper drive shaft to produce a phase detecting signal which is effective during a predetermined time period corresponding to the rotation phase of the upper shaft; and switching means TM rendered operative in response to information indicating an operation of the sewing machine forming the straight stitches while the fabric is transported in the backward fabric feeding direction, the switching means being responsive to the phase detecting signal to produce a first signal, said first signal making effective the swing control signal of the second memory means to operate the drive means to swing the needle laterally of the fabric feeding direction from the predetermined basic needle position, the switching means subsequently producing a second signal during the predetermined time period, the second signal making effective the straight stitch control signal of the first memory means ML to operate the drive means to thereby return the needle to the predetermined basic needle position.

4,627,372
FLOTATION HULL AND BOATS MADE THEREFROM

Otis W. Douglas, III, 5218-C Castlewood Rd., Richmond, Va. 23234

Filed Jun. 17, 1985, Ser. No. 745,497
Int. Cl.[4] B63B 7/04
U.S. Cl. 114—61 12 Claims



1. A flotation hull comprised of:

(a) at least one pontoon unit of block-like configuration comprised of four flat side walls of rectangular configuration joined at their edges to form four parallel side corners, and two bulkhead end walls positioned at the extremities of said side walls in perpendicular relationship thereto and forming end corners therewith, said end walls being adapted to permit joinder of adjacent pontoon units in a manner such that their end walls are in close parallel juxtaposition while the side walls of adjacent pontoon units are in coplanar alignment, and

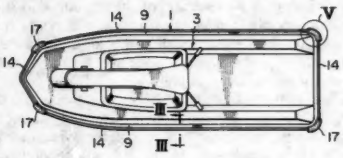
(b) a nose piece attached to each terminal end wall of a sequence of one or more pontoon units, said nose piece having a four sided pyramidal shape with a base periphery congruent with the end corners of said terminal end wall, the pointed extremities of said nose pieces being directed away from said pontoon units,

(c) said hull being impervious to entrance of water into the interior thereof.

4,627,373
CONSTRUCTION FOR COUPLING DECK TO HULL OF SMALL-SIZED MARINE CRAFT

Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Feb. 5, 1985, Ser. No. 698,427
Claims priority, application Japan, Feb. 8, 1984, 59-17171[U]
Int. Cl.[4] B63B 5/24
U.S. Cl. 114—182 2 Claims



2. A deck-hull coupling construction for a small-sized marine craft comprising:

a deck flange extending horizontally from a peripheral edge of a deck of said marine craft;

a hull flange extending horizontally from a peripheral edge of a hull of said marine craft and adapted to underlie said deck flange;

an upwardly extending deck bumper constituted by upwardly bent outer extremity of said deck flange;

a downwardly extending hull bumper constituted by downwardly bent outer extremity of said hull flange;

protector means having a C-shaped cross-section and fitting around both said extremities and the periphery of said deck bumper and said hull bumper and retained by said extremities along spaced portions of the periphery of said bumpers;

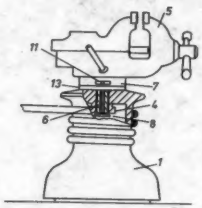
said upwardly extending deck bumper and downwardly extending hull bumper extending peripherally of said craft and terminating adjacent sharply rounded corners of said craft leaving gaps in said bumpers, said protector means extending substantially coextensively with said bumpers; and

fender means having a C-shaped cross-section and extending along said gaps in said bumpers to cover said flanges and attached to end portions of said protector means adjacent said gaps.

4,627,374
ACCESSORY FOR YACHTS

Brian L. Wright, 338 Bideford Green, Linslade, Bedfordshire, England LU7 7TX

Continuation-in-part of Ser. No. 358,350, Mar. 15, 1982, abandoned. This application Oct. 3, 1984, Ser. No. 658,039
Claims priority, application United Kingdom, Mar. 19, 1981, 8108568; Jun. 15, 1981, 8118276; Nov. 4, 1981, 8133187
Int. Cl.[4] B63B *21/16*
U.S. Cl. 114—218 **5 Claims**

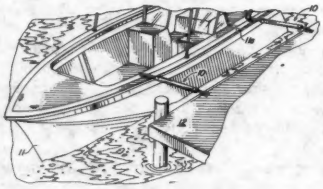


1. A mounting device capable of rigidly mounting an accessory or one of a range of accessories on a yacht, comprising;
(a) mounting means for the accessory,
(b) a supporting leg depending from said mounting means and adapted to locate in the handle receiving socket of a winch,
(c) a locking device provided on said support leg and by which the mounting means can be releasably locked in the winch socket, said locking device comprising a plate of the same shape and dimensions as the cross-section of said leg and which can be dis-placed from a first position in which it does not extend beyond the cross-section of the leg and so permits insertion of the leg into said socket, to a second position in which it projects laterally from said cross-section to effect locking of said leg in said socket,
(d) a post integral with said plate and extending along the inside of said leg,
(e) a pin which extends transversely through said post whereby by angular movement of said pin about the axis of said post, said post can be rotated within said leg to move said plate between said first and second positions, and
(f) a clamping member threadedly engaging with the outside of said leg whereby after said mounting device has been locked in the winch said clamping member can be adjusted by screwing it down said leg to engage the winch and so take up any slackness in the mounting of the mounting device to the winch.

4,627,375
BOAT MOORING DEVICE

Roy F. Davis, and William Murphy, both of 1223 Periwinkle Way, Sanibel, Fla. 33957

Filed Mar. 4, 1985, Ser. No. 707,961
Int. Cl.[4] B63B *21/00*
U.S. Cl. 114—230 **5 Claims**

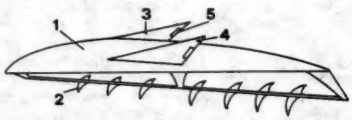


1. A device for mooring a boat to a dock comprising
an elongated cylinder having an axial hole in each of its two ends for slidable passage of a piston rod,
a first piston designed to move back and forth along the axis of said cylinder,
a first piston rod having one end affixed to said first piston and its other end designed to be removably attached to the boat,
a first helical coiled spring surrounding that portion of the first piston rod lying within said cylinder,
a second piston designed to move back and forth along the axis of said cylinder,
a second piston rod having one end affixed to said second piston and its other end designed to be removably attached to the dock, and
a second coiled helical spring floating within said cylinder between said first and second pistons.

4,627,376
WATERCRAFT PROVIDED WITH TRIM STABILIZERS UTILIZING DIFFERENT FLUIDS

Corrado Scarfo, and Paolo Scarfo, both of Via Bevagna 68, Roma, Italy

Continuation of Ser. No. 419,190, Sep. 17, 1982, abandoned. This application May 2, 1985, Ser. No. 729,666
Claims priority, application Italy, Sep. 21, 1981, 49332 A/81
Int. Cl.[4] B63B *1/16*
U.S. Cl. 114—272 **2 Claims**



1. A watercraft having attitude stabilizing members utilizing different fluids, said watercraft comprising a hull with a bow and a stern and having a longitudinal axis, a beam having a longitudinal axis located beneath the hull and extending along the length of the hull, the longitudinal axis of the beam being in a plane with the longitudinal axis of the hull and non-parallel thereto, the two axes intersecting adjacent the bow of the boat, a first stabilizing member which effects longitudinal attitude stabilization by contact with water, said first stabilizing member comprising at least three narrow hydrodynamic wings attached in a row along the length of the beam, the largest dimension of the wings being transverse to the longitudinal axis of the beam and extending on both sides thereof, the wings being of differing surface areas with the wing having the largest surface area being nearest the stern and with the wing having the smallest surface area being nearest the bow, and two second attitude stabilizing members attached to the hull and extending generally upwardly so as to effect transverse stabilization by contact with air, the second attitude stabilizing members each comprising an aerial wing having a controllable aileron, the outward ends of each of the aerial wings having means for emitting a fluid in an amount and at a pressure sufficient to help effect stabilization.

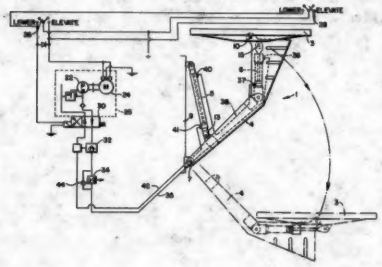
4,627,377
DAVIT DEVICE

Alain Zoonens, 147 bis rue de Silly, Boulogne, France

Filed Feb. 15, 1985, Ser. No. 702,086
Int. Cl.[4] B63B *23/02*
U.S. Cl. 114—373 **10 Claims**

1. A lifting and lowering device for use with a vehicle comprising a platform mounted on the vehicle and extending outside said vehicle, pivoting arm means having a free end articulated to the platform and its other end pivoted to the vehicle, a first hydraulic jack mounted between the platform and said arm means and a second hydraulic jack mounted between said arm means and said vehicle, means for connecting one or the

other of respective opposite ends of said first and second jacks to a source of fluid pressure while simultaneously connecting to drain that one of said opposite ends which is not connected to said source, and means fluidly connecting together the other



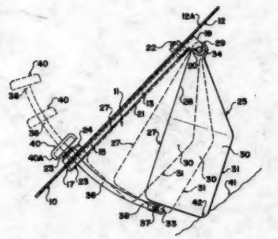
respective opposite ends of said jacks such that when either one of said jacks is operated in response to fluid pressure it transmits fluid pressure to the other jack to operate it simultaneously with said one jack.

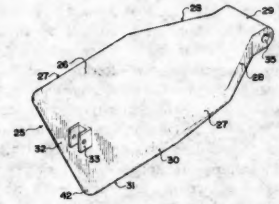
4,627,378

FILL GATE FOR GRAIN BINS AND THE LIKE

Cecil E. Manness, Box 4, Domain, Manitoba, Canada R0G 0M0, and Leo J. Nolette, Box 195, St. Agathe, Manitoba, Canada R0G 1Y0

Filed May 6, 1985, Ser. No. 730,591
Claims priority, application Canada, May 10, 1984, 453990
Int. Cl.[4] G01F *23/32, 23/34*
U.S. Cl. 116—229 **16 Claims**





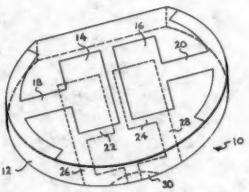
1. A fill indicator for grain bins and the like having a sloping roof; comprising in combination a mounting member for securement to the sloping roof, a substantially wedge shaped float with means pivotally secured at one end thereof to said mounting member to depend therefrom when installed, guide means secured adjacent the other end of said float and extending upwardly therefrom, and indicating means on the distal end of guide means, said float including a substantially planar upper surface having side edges extending substantially parallel to one another from the other end of said float towards said one end thereof and converging towards said one end and terminating in a mounting means adjacent said one end, a pair of sides depend downwardly and inwardly from said side edges to form a keel portion substantially parallel to the upper surface from said other end towards said one end, said keel then inclining upwardly towards said one end at which said keel substantially meets said upper surface at said pivotably secured means, said sides also converging towards said one end from the location at which the keel commences inclining upwardly.

4,627,379

SHUTTER APPARATUS FOR FINE-TUNING A COUPLED-DUAL RESONATOR CRYSTAL

Gerald E. Roberts, Lynchburg, and Samuel Toliver, Rustburg, both of Va., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 29, 1984, Ser. No. 676,124
Int. Cl.[4] C23C *13/08*
U.S. Cl. 118—721 **13 Claims**



1. Shutter apparatus for use in tuning resonator crystals or the like by the vapor deposition process in which a material is plated on both the active and ground sides of a crystal through masks associated with each side of the crystal, the shutter apparatus comprising:

a first sliding shutter disposed between a first deposition material source and an active side mask having a plurality of apertures equal to the number of areas to be plated on the active side of the crystal, said first sliding shutter having a plurality of apertures equal to the number of active side mask apertures, each first shutter aperture being separated laterally and vertically from the other first shutter apertures, said first sliding shutter being movable to a number of positions equal to the number of first shutter apertures, and wherein at each position only one first shutter aperture is aligned with one active side mask aperture;

a second sliding shutter disposed between said first deposition material source and said active side mask, said second sliding shutter being movable to two positions, a first position at which said second sliding shutter blocks the flow of deposition material to said active side mask regardless of the position of said first sliding shutter, and a second position at which said second sliding shutter does not interfere with the flow of deposition material through said first sliding shutter apertures regardless of the position of said first sliding shutter;

means attached to said first and second sliding shutters for moving said shutters sequentially from one position to another;

a third sliding shutter disposed between a second deposition material source and a ground side mask having a coupling adjust spot aperture therein, said third sliding shutter having an aperture therethrough in substantial alignment with said coupling adjust spot aperture when said third sliding shutter is in a first position and in complete misalignment with said coupling adjust spot aperture when said third sliding shutter is in a second position; and

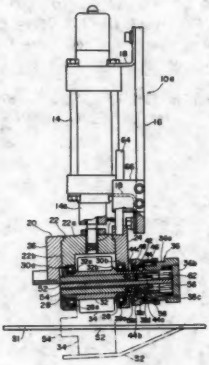
means attached to said third sliding shutter for sliding said shutter between its first and second positions.

4,627,380

MARKING APPARATUS FOR COLORING LATERAL EDGE OF SHEET

Yoshinori Tahara, Numazu, Japan, assignor to Mei San Co., Ltd., Japan

Filed Jun. 17, 1985, Ser. No. 745,626
Claims priority, application Japan, Mar. 9, 1985, 60-47292
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—77 **5 Claims**



1. A marking apparatus for coloring a lateral edge of a sheet moving along its longitudinal axis which comprises:

(a) a marking head comprising (i) a body, (ii) a tubular shaft mounted on said body for rotation about an axis of said shaft, (iii) a roller fixedly mounted on said tubular shaft for rotation therewith, (iv) an elongated coloring element of a solid material received in said tubular shaft and having one end extending outwardly of one end of said tubular shaft a predetermined distance, and (v) means for preventing the rotation of said coloring element relative to said tubular shaft; and

(b) an actuator operable to move said marking head in a plane perpendicular to the plane of the sheet in which the lateral edge of the sheet lies so as to bring an end face of the one end of said coloring element into contact with the lateral edge of the sheet to apply a marking thereto, the axis of said tubular shaft being disposed transversely of a path of travel of the sheet and inclined with respect to the plane of the sheet with one end of said tubular shaft being closer to the plane of the sheet than the other end of said tubular shaft.

4,627,381

DISPOSABLE TRAY AND STAND

David M. Reed, 1924 E. 5th Ave., Mesa, Ariz. 85204, and Michael R. Johnson, 829 S. Extension, Mesa, Ariz. 85202

Filed Aug. 2, 1985, Ser. No. 761,688
Int. Cl.[4] A01K *23/00*
U.S. Cl. 119—1 **1 Claim**

1. A disposable tray with litter for animals, including

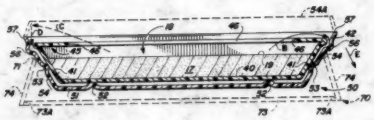
a. a container having a base and a substantially upright wall about the periphery of said base, said upright wall having an upper edge circumscribing said base;

b. a volume of absorbent particles in said container, said volume being sufficient to maintain a generally horizontally disposed upper surface level of particles above said base and beneath said upper edge of said wall when said particles are evenly distributed over said base;

c. a lip attached to and outwardly extending from said upper edge of at least one of said side walls over said base, and having an inner edge spaced away from said wall and spaced away from said upper surface level of said particles; and,

d. a lid having a peripheral lip and shaped and dimensioned to be positioned beneath said base such that

(i) said container is generally maintained in said lid with said base and wall of said container spaced away from said lid;



(ii) said lid receives said container such that

said lid extends upwardly above said lip of said container, and

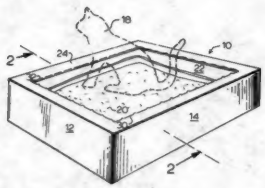
particles directed from said container over said lip thereof and against said lip of said lid can fall downwardly between said wall of said container and said lid.

4,627,382

DISPOSABLE LITTER BOX

Dennis K. Muzzey, 16402 Jacquie Ave., Lockport, Ill. 60441

Filed Sep. 4, 1984, Ser. No. 646,783
Int. Cl.[4] A01K *23/00*
U.S. Cl. 119—1 **1 Claim**



1. A storable and shippable disposable litter box for cat wastes, comprising:

a box fillable with cat litter;

a flat top lid removably mounted on said box, containing a plurality of perforations and reusable as an absorbant bottom liner for the cat litter,

means for moisture proofing, the exterior of said box so that moisture does not ingress during storage and shipment and the cat wastes do not egress after use,

wherein said top lid has a top surface that is uncoated and a bottom surface which is moisture proofed so that before said top lid is removed the disposable litter box is moisture proofed and the uncoated top surface can be used for imprinting for the box and when the disposable litter box is used said top lid is placed uninverted with said uncoated top surface facing upwardly, under the cat litter, so as to act as an absorbant bottom liner, and

wherein said perforations are semi-circular in shape and contain inwardly facing arcs and straight line edges, said edges and arcs being moisture proofed, so that one or more user fingers can be inserted for removing said top lid, wherein said semi-circular perforations being closely

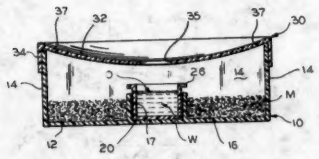
spaced so that when said top lid is removed, the surface area of said box not moisture proofed is minimized.

4,627,383

ANIMAL WASTE COLLECTION ARRANGEMENT

Romain Metzger, Deerfield, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Feb. 7, 1985, Ser. No. 699,352
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 **6 Claims**



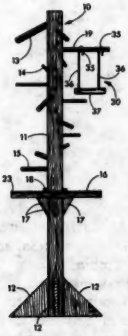
1. In a sanitary arrangement for collecting pet animal wastes, the combination of:
   (a) a housing having a bottom wall and at least one side wall extending upwardly therefrom to form therewith a box-like structure open at the top;
   (b) a readily removable cover seated on said housing;
   (c) said cover having an opening extending therethrough at the lowest area thereof for the passage of animal wastes and being inclined gradually downwardly from its outer periphery toward said opening;
   (d) a removable waste receiving receptacle positioned on the bottom wall of said housing under said opening;
   (e) a wall-like element extending upwardly from said said housing bottom wall to surround said receptacle.

4,627,384

BIRD TREE APPARATUS

Marc A. Courteau, 7538 18th Ave., S., Richfield, Minn. 55423

Filed Dec. 17, 1984, Ser. No. 682,689
Int. Cl.[4] A01K *31/12*
U.S. Cl. 119—26 **10 Claims**



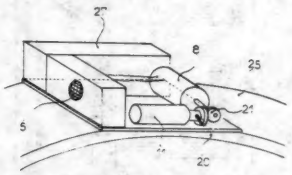
1. A bird tree apparatus for exercising the anatomical features of a domestic bird to reduce the atrophying effect on the leg and foot muscles, for removably collecting food and bird droppings, and for holding aviary toys, said bird tree apparatus comprising:
   a. an upright support member having upper, lower and intermediate portions and having a predetermined width, said intermediate portion further having a horizontally disposed slot thereinto and having generally parallel top and bottom surfaces spaced a predetermined height and further having opposing platform support members each having a generally flat top surface affixed to said support member, said platform support member top surfaces being in planar communication with the bottom surface of said support member slot,
   b. a plurality of outwardly extending base members attached to the lower portion of said support member to hold said support member in a generally vertical position,
   c. a frictionally held and quickly removable horizontally disposed platform member having an elongated notch thereinto and extending to generally its midportion for engaging said support member, said platform member being for collecting bird food, aviary toys and droppings, said platform member being removably mountable at said horizontally disposed slot at the intermediate portion of said upright support member, and for placement on said opposing platform support members,
   d. a locking plate member having a predetermined thickness approximately said predetermined support member slot height and having a width greater than said predetermined support member width, said locking plate for insertion into said support member slot and for engaging said platform member for permitting the quick removal of said platform member without disassembly of the structural elements of said device, and
   e. a plurality of elongated perch members attached to and extending outwardly from said upper portion of said support member, said perch members consisting of a plurality of diameter dimensions to provide a bird with means to exercise its leg muscles by providing perch members having a plurality of claw gripping diameters, said elongated perch mambers further being of a wood dowel construction having a diameter range from 1/16 to 2 inches.

4,627,385

BARK RESTRAINING DEVICE FOR DOGS

Rene Vinci, 4 Rue Raymond Bistors, Perpignan, Pyrenees Orientales, France

Filed Mar. 7, 1985, Ser. No. 709,433
Int. Cl.[4] A01K *15/00*
U.S. Cl. 119—29 **6 Claims**



1. A device for dissuading a dog from barking and adapted to be carried by a collar worn by the dog around its neck, said device comprising:
   sound sensing means sensitive to sound frequencies characteristic of the frequency of the bark of the dog, said sound sensing means further being adapted to emit an electrical signal when actuated by the bark of the dog; and
   means responsive to said electrical signal and carrying a substance which is adapted to dissuade the dog from barking, said means further being adapted to discharge a portion of said substance in the region of the head of the dog in response to said electrical signal, said means responsive to said electrical signal comprising a tank, said substance carried by said means responsive to said electrical signal being carried within said tank in a pressurized condition, said means responsive to said electrical signal further comprising a spray valve operatively associated with said tank, said spray valve further being activatable

by said electrical signal to release said substance from said tank and to discharge said substance in a spray through said spray valve.

4,627,386

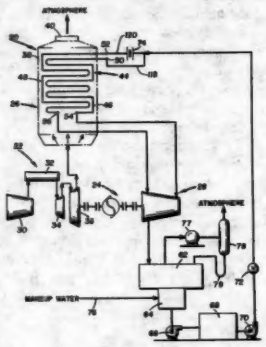
STEAM GENERATORS AND COMBINED CYCLE POWER PLANTS EMPLOYING THE SAME

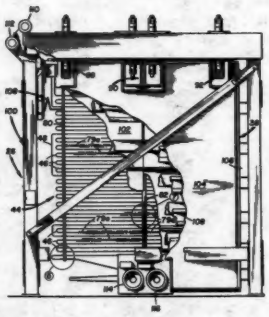
Thomas E. Duffy, San Diego; John P. Archibald, La Jolla, and Alan H. Campbell, Encinitas, all of Calif., assignors to Solar Turbines, Inc., San Diego, Calif.

Continuation of Ser. No. 483,437, Apr. 8, 1983, abandoned. This application Apr. 16, 1985, Ser. No. 723,648

Int. Cl.[4] F22B *33/14*

U.S. Cl. 122—1 B 7 Claims





1. A once-through boiler comprising: a vertical casing having a gas inlet and a gas outlet respectively located at the lower and upper ends thereof; an overhead support structure in said casing; a plurality of independent steam generating circuits hung from said support structure, each of said circuits comprising a single, sinuous low pressure tube with horizontal tube runs and a high pressure tube of similar configuration internested with the low pressure tube, said horizontal tube runs being so staggered as to increase the transfer of heat from hot gases flowing upwardly through said casing to said high and low pressure tubes and said high pressure tubes each having feedwater, vaporizer, and superheater sections with said vaporizer and superheater sections being of greater diameter than the feedwater sections; and a feedwater pump for effecting a flow of water into said low and high pressure tubes at the inlet ends thereof.

4,627,387

FLUIDIZED-BED APPARATUS WITH A HEAT EXCHANGER AND AN ADDITIONAL-AIR BLOWING NETWORK

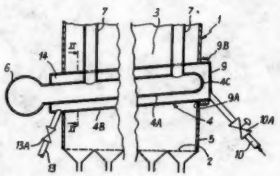
Roger M. Puff, Lens, and Jacques P. Dreuilhe, L'Isle Adam, both of France, assignors to Charbonnages de France; Framatome and Institut Francais du Petrole, all of Paris, France

Filed Oct. 1, 1985, Ser. No. 782,556

Claims priority, application France, Oct. 2, 1984, 84 15105

Int. Cl.[4] F22B *1/00*

U.S. Cl. 122—4 D 10 Claims



1. A fluidised-bed apparatus with at least one heat exchanger having a lower header which is slightly inclined to the horizontal and is situated in the fluidised bed during operation, an upper header, and a plurality of upright tubes which extend between the lower header and the upper header, the lower header consisting of an internal duct, which is connected to a circuit for the heat-exchange fluid and from which the upright tubes extend, and an external duct, which is connected to an additional blowing gas supply line and is provided with blowing nozzles.

4,627,388

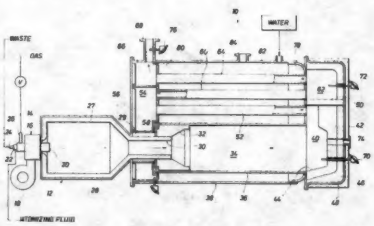
COMBUSTION OF HALOGENATED HYDROCARBONS WITH HEAT RECOVERY

Jack E. Buice, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 22, 1985, Ser. No. 757,224

Int. Cl.[4] F22B *7/12*

U.S. Cl. 122—149 16 Claims



1. A water-cooled, horizontal fire-tube boiler having an affixed end section, a boiler section, and a second end section, which comprises in combination:

(a) a boiler section comprising a generally closed shell having a vertically disposed metal tube-sheet at each end, said shell holding water between said ends, a relatively long secondary combustion chamber extending along the length of, and within, said shell, and communicating through said tube-sheets, a plurality of relatively small metal return-tubes extending the length of, and within, the boiler shell and communicating through said tube-sheets, the secondary combustion chamber and the return-tubes being in spaced horizontal relationship;

(b) wherein said boiler section defines a folded multi-segment flue gas discharge path therethrough;

(c) a front end nozzle section adjacent a confined primary combustion chamber for containing combustion gases,

said primary combustion chamber communicating with said secondary combustion chamber and into said return-tubes, and having feed means for feeding air, supplemental fuel, and halogenated hydrocarbons into a burner nozzle within the primary combustion chamber;

(d) means for blowing air past said nozzle to define a flame front having a temperature in the range of from about 1,000° C. to about 1,800° C. to combust halogenated hydrocarbons;

(e) said primary combustion chamber having an elongate extent sufficient to enclose therein the flame front, and wherein said primary combustion chamber terminates opposite said burner nozzle in an aligned and streamlined relation therewith, insulation covered wall means defining an outlet directing flue gas flow from said primary combustion chamber into said secondary combustion chamber;

(f) said outlet being sufficiently spaced from the flame front and sufficiently long that flue gas temperature at the end of said secondary combustion chamber is less than 1,000° C. at entry into said folded multi-segment flue gas discharge path;

(g) end section means comprising a confined space for containing combustion gases, said space communicating with said secondary combustion chamber and said return-tubes and defining a portion of said folded multi-segment flue gas discharge path;

(h) said shell and said end section means having surfaces, except for the tube-sheet surfaces, which are exposed to the combustion gases when the boiler is in operation, made of corrosion-resistant material or covered with an amount of insulation predetermined to maintain the temperature of such surfaces within a predetermined temperature range during operation;

(i) means for supplying water into said shell;

(j) a means for removing steam from said shell; and

(k) flue means for removing combustion gases from one of the end sections.

4,627,389

TWO-STROKE INTERNAL COMBUSTION ENGINE

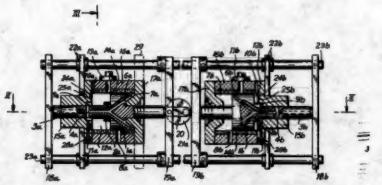
Istvan Simon, Rosengässchen 7, 8200 Schaffhausen, Switzerland

Filed Jul. 22, 1985, Ser. No. 757,658

Claims priority, application Switzerland, Jul. 24, 1984, 3575/84

Int. Cl.⁴ F02D *19/00*; F02B *75/24*

U.S. Cl. 123—25 C **8 Claims**



1. In a two-stroke internal combustion engine having two coaxial pistons mounted for equal movements on opposite strokes, a crankshaft located between the pistons which have faces adjacent the crankshaft formed to assist the introduction of fresh air during the inlet stroke, and a fresh air inlet port and a waste gas outlet port located on opposite sides of the piston chamber near its centre, the improvement comprising

(a) two piston rods, each carrying one of the pistons,

(b) a frame-like guide cradle in which said piston rods are mounted,

(c) a cylindrical extension on the combustion chamber face of piston,

(d) an extension of the combustion chamber of each cylinder which receives the corresponding cylindrical piston extension in the compression position of the piston,

(e) a fresh air supply channel extending longitudinally of each piston rod,

(f) fresh air supply channels which lead from each piston end face adjacent the crankshaft into said associated longitudinal channel,

(g) a further channel extending across each piston rod communicating with said longitudinal channel and opening, in the dead centre position of the associated piston, when in the compression position, into said extension of the combustion chamber of the associated cylinder,

(h) a projecting guide boss on the base of each cylinder remote from the crankshaft which guide boss receives the associated piston rod and closes the associated further cross channel when said channel is located within the boss,

(i) a fuel injection port formed in each cylinder casing adjacent the base of the cylinder,

(j) a separate water injection port leading into the extension of each combustion chamber,

(k) a separate non-return valve connected to each water injection port.

4,627,390

FUEL INJECTION DEVICE FOR TWO-STROKE ENGINE

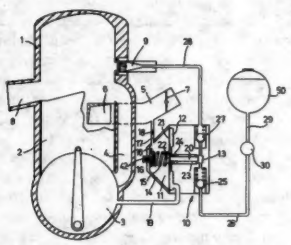
Hubert J. F. Antoine, Chemin des Vignerons 32, 5150 Xépion, Belgium

Filed Jul. 19, 1984, Ser. No. 632,310

Claims priority, application Belgium, Jul. 28, 1983, 0/211260; May 28, 1984, 0/213014

Int. Cl.⁴ F02D *3/02*

U.S. Cl. 123—73 CB **12 Claims**



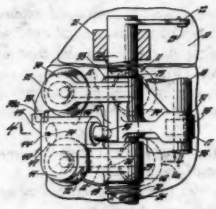
1. Fuel injection device for a two-stroke engine with precompression in its casing, characterised by a pump body comprising a first chamber vented to outer atmosphere, the first chamber also communicating with an air intake pipe, a second chamber having a communication line communicating with a precompression casing of the engine, said second chamber being separated from the first chamber by a movable partition which is integral with a support held by a spring; a piston resting on the support and sliding axially in a channel when the movable partition displaces the support; and a third chamber having an opening communicating with a fuel inlet opening into an engine cylinder in a substantially radial direction so as to spray the fuel over the sweeping current, the third chamber being located at an end of said channel so that when the movable partition displaces the support one end of the piston is displaced, thereby varying the pressure prevailing in the third chamber, so as to take in a quantity of fuel when the movable partition compresses the spring and to force a quantity of fuel towards the injector when the spring is released.

4,627,391

ENGINE VALVE TRAIN SYSTEM

John G. Derringer, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 24, 1984, Ser. No. 685,459
Int. Cl.[4] F02D 13/06; F01L 1/34
U.S. Cl. 123—90.16 3 Claims



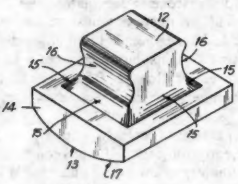
1. A reciprocating internal combustion engine of the type having an engine block means defining at least one cylinder with an associate pair of ports, a valve located for axial movement in each of said ports with each said valve normally biased to a valve closed position relative to its associate port, rocker shaft support means fixed to said engine block means, and a valve actuator spaced from said valves and operable to effect reciprocation of said valves, the improvement comprising: a rocker shaft pivotably supported by said rocker shaft support means, said rocker shaft having an axial passage adapted to be in continuous flow communication with the pressurized lubricant supply of the engine; a first rocker arm pivotably supported on said rocker shaft in position for engagement with said valve actuator and with one of said valves and actuated in rocking movement whereby it can operate to effect opening and closing movement of said one of said valves, and a second rocker arm pivotably supported on said rocker shaft next adjacent to said first rocker arm and operatively engaging the other one of said valves, said second rocker arm having a hydraulic cylinder means therein, a piston sealingly journaled in said hydraulic cylinder means and located so as to permit engagement of said piston with said first rocker arm, said second rocker arm having a supply/drain passage means therein to said hydraulic cylinder means, and a drain passage which extends to the exterior of said second rocker arm and which is located in circumferentially spaced apart relationship to said supply/drain passage means, said rocker shaft having at least one radial riser supply passage in flow communication with said axial passage and a chordal exterior drain groove circumferentially spaced from said supply passage both said radial riser supply passage and said chordal exterior drain groove being axially located on said rocker shaft so as to be in radial alignment with said supply/drain passage means and with said drain passage in said second rocker arm; and, drive means operatively connected to said rocker shaft to effect pivotable movement thereof between a first position at which said supply passage is in flow communication with said supply/drain passage means whereby pressurized lubricant can be supplied to said hydraulic cylinder to effect movement of said piston in a direction whereby said second rocker arm will be operatively driven by said first rocker arm, and a second position at which said supply passage is out of flow communication with said supply/drain passage means and said drain groove is in a position to effect flow communication between said supply/drain passage means and said drain passage whereby said second rocker arm will be operatively disconnected from said first rocker arm.

4,627,392

CERAMIC TIP CAST IN VALVE ROCKER ARM

Keisuke Tashiro, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and NGK Insulators, Ltd., both of Japan

Filed Apr. 17, 1985, Ser. No. 724,061
Claims priority, application Japan, Apr. 18, 1984, 59-55892
Int. Cl.[4] F01L 1/18
U.S. Cl. 123—90.39 6 Claims



1. In a cast ceramic tip for a rocker arm of an automotive engine, a slipper block having a contoured cam engaging surface extending longitudinally of one face thereof, and having a retainer block formed integrally with said slipper block and extending substantially perpendicular to an opposite face of said slipper block, said retainer block having opposite longitudinally extending faces and opposite laterally extending faces, the improvement comprising:

radiused fillets extending laterally of said opposite faces of said slipper block, and providing transitions between said opposite face thereof and said opposite laterally extending faces of said retainer block; and,

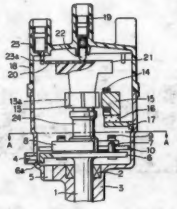
retaining channels formed exclusively in said longitudinally extending faces of said retainer block, said laterally extending faces being substantially planar.

4,627,393

IGNITION DISTRIBUTOR

Akihiko Takenaka, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 20, 1985, Ser. No. 746,791
Claims priority, application Japan, Jun. 28, 1984, 59-134782
Int. Cl.[4] F02P 7/02
U.S. Cl. 123—146.5 A 6 Claims



2. An ignition distributor for an internal combustion engine, comprising:

a distributor housing including a body and a cap;

a drive shaft rotatably supported by said housing to be driven by the internal combustion engine;

a rotor electrode secured to a rotor drivingly connected with said drive shaft;

a plurality of spaced counter-electrodes carried by said cap; and

means for controlling ventilation communication between the inside and the outside of said distributor housing in

accordance with the timing of the discharges between said rotor electrode and said counter-electrodes.

4,627,394

CYLINDER BLOCK FOR INTERNAL COMBUSTION ENGINE

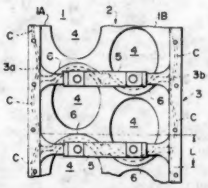
Koji Asanomi, and Ryoji Abe, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Mar. 15, 1985, Ser. No. 712,142

Claims priority, application Japan, Mar. 21, 1984, 59-40236[U]

Int. Cl.⁴ F02F *7/00*

U.S. Cl. 123—195 R **3 Claims**



1. A cylinder block for a V-type engine comprising a cylinder portion and a skirt portion connected to a lower side of said cylinder portion, said cylinder portion comprising a pair of cylinder banks, each cylinder bank having a plurality of cylinders arranged in a row and a pair of opposed side walls extending in a direction along the rows of the cylinders with the cylinders each having a contour and being disposed between said side walls said skirt portion defining a crank chamber and having a pair of opposed side walls extending in a direction along the rows of the cylinders, and each integrally formed of a plurality of sinuous outwardly bulging bight portions, characterized in that the bight portions in one side wall of said skirt portion have a phase which is displaced from that in the other side wall of said skirt portion wherein the outwardly bulging light portions of each of the side wall of said skirt portion is formed in alignment corresponding to integrally formed outwardly bulging bight portions of the row of the cylinders of the respective cylinder banks which follow the contour of each of the cylinders.

4,627,395

INTAKE SYSTEM FOR ROTARY PISTON ENGINES

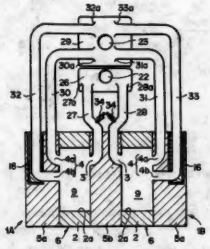
Tomoo Tadokoro; Haruo Okimoto, and Ikuo Matsuda, all of Hiroshima, Japan, assignors to Madza Motor Corporation, Hiroshima, Japan

Filed Apr. 17, 1985, Ser. No. 724,313

Claims priority, application Japan, Apr. 19, 1984, 59-79547; May 23, 1984, 59-104993; May 24, 1984, 59-106255

Int. Cl.⁴ F02B *53/04*

U.S. Cl. 123—216 **10 Claims**



1. A two rotor type rotary piston engine including a casing comprised of a pair of rotor housings each having an inner wall of trochoidal configuration, an intermediate housing located between the rotor housings and a pair of side housings secured to outer sides of the respective rotor housings to define rotor cavities in the respective rotor housings, a pair of substantially polygonal rotors disposed in the respective rotor cavities with apex portions in sliding engagement with the inner walls of the respective rotor housings to define working chambers of cyclically variable volumes, said rotors being carried by eccentric shaft means so that said rotors are rotated with 180° phase difference in terms of angle of rotation of said eccentric shaft means, intake means including individual intake port means provided in at least one of said intermediate and side housings to open to the respective rotor cavities and adapted to be cyclically closed by said rotors as the rotor rotates, intake passage means including common air chamber means and individual passage means having one set of ends leading respectively to said intake port means and the other ends opened to said air chamber means through openings which are opposed to each other in said air chamber means with a spacing therebetween, said intake port means having opening period which is related to overall length of said individual passage means and said spacing between said openings so that a compression wave produced in one individual passage means in opening timing of one intake port means is transmitted to the other intake port means just before said other intake port means is closed to obtain an additional charge within a specific engine speed range.

4,627,396

INTAKE CONTROL SYSTEM OF ENGINE

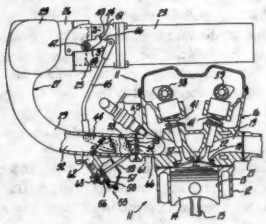
Takumori Yoshida, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 10, 1982, Ser. No. 356,811

Claims priority, application Japan, Mar. 12, 1981, 56-34558

Int. Cl.⁴ F02M *35/10*

U.S. Cl. 123—302 **17 Claims**

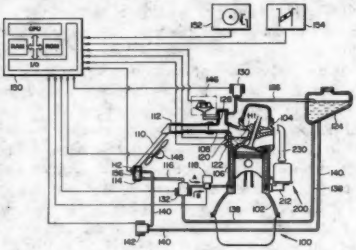


1. In an induction system for a internal combustion engine comprising a chamber, a first intake passage communicating with said chamber, a second intake passage communicating with said chamber, said intake passages having a common portion upstream of their communication with said chamber, and a first manually operated throttle valve in said common portion of said intake passages, the improvement comprising a second manually operated throttle valve in said first intake passage between said first manually operated throttle valve and said chamber, linkage means for controlling the position of said second manually operated throttle valve in response to the position of said first manually operated throttle valve, a third throttle valve in said second induction passage between said first throttle valve and said chamber, and means for automatically operating said third throttle valve.

4,627,397
COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 27, 1985, Ser. No. 780,936
Claims priority, application Japan, Sep. 29, 1984, 59-202945
Int. Cl.⁴ F01P 3/22, 3/12
U.S. Cl. 123—41.27 **15 Claims**



1. A cooling system for an internal combustion engine having a structure subject to high heat flux and a lubricant system, comprising:

a coolant jacket disposed about said structure and into which coolant is introduced in liquid form and permitted to boil;

a radiator in which gaseous coolant is condensed to its liquid state;

a vapor transfer conduit leading from said coolant jacket to said radiator for transferring coolant vapor from said coolant jacket to said radiator for condensation therein;

means for returning liquid coolant from said radiator to said coolant jacket in a manner to maintain said structure immersed in a predetermined depth of liquid coolant;

a device associated with said radiator for varying the rate of heat exchange between the radiator and a cooling medium which surrounds said radiator;

a first parameter sensor for sensing a parameter which varies with the temperature of the coolant in said coolant jacket;

a second parameter sensor for sensing a parameter which varies with the load on the engine;

a circuit response to said first and second parameter sensors for operating said device in a manner which tends to maintain the temperature of the coolant in said coolant jacket at a level determined in response to the load on said engine;

a housing in fluid communication with said coolant jacket; and

a heat exchanger disposed in said housing and immersed in liquid coolant, said heat exchanger being arranged to have lubricant from engine lubricating system circulated therethrough.

4,627,398
ELECTRONIC SPARK ADVANCE-TYPE IGNITION SYSTEM

Hiroshi Koike, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,862
Claims priority, application Japan, Nov. 30, 1983, 58-224248
Int. Cl.⁴ F02P 5/155
U.S. Cl. 123—418 **5 Claims**

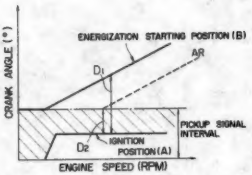
1. An electronic spark advance-type ignition system for an internal combustion engine comprising:

an ignition coil;

a magnetic pickup for generating a pair of pulse signals with a time interval therebetween substantially corresponding to a maximum advance angle in terms of crankshaft rotation degrees for each rotation of a crankshaft of said engine;

signal generating means responsive to said pair of pulse signals from said pickup for generating a pair of comparison signals of different levels within each of the crankshaft rotation degrees of said maximum advance angle and the other crankshaft rotation degrees; and

control means for comparing the signal levels of each of said pairs of comparison signals to generate an energization starting position signal and an ignition timing determining ignition position signal for said ignition coil,

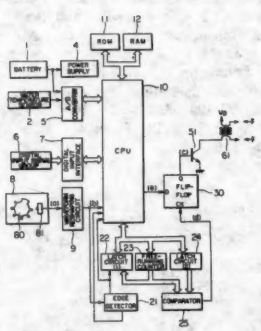


said signal generating means including means for controlling the waveform of one of said pair of comparison signals so that said ignition position signal is advanced in angle with respect to said energization starting position signal, whereby said energization starting position signal is generated under all conditions prior to the timing of generation of the earlier one of the next pair of pulse signals generated from said pickup and said ignition position signal is generated within said maximum advance angle at a point in time following generation of said earlier one of said next pair of pulse signals by at least a predetermined amount.

4,627,399
LOAD DETECTING APPARATUS AND IGNITION CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

Tatsuya Yoshida, Katsuta, and Hiroshi Katada, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1985, Ser. No. 699,542
Claims priority, application Japan, Mar. 7, 1984, 59-43358
Int. Cl.⁴ F02P 5/15
U.S. Cl. 123—419 **21 Claims**



1. An ignition control apparatus for an internal combustion engine comprising:

a crankshaft reference position detector for detecting a plurality of reference angular positions of a crankshaft of an engine and for producing pulse signals at said reference angular positions;

means responsive to said pulse signals from said crankshaft

reference position detector for determining the interval rotation speed of the engine for each of the intervals between said pulses;

means responsive to said interval rotation speeds from said interval rotation speed determining means for determining a speed pulsation value for each revolution of said crankshaft;

means for determining the speed of said engine; and

means for controlling the ignition of said engine in accordance with said speed pulsation value from said speed pulsation value determining means and said engine speed from said engine speed determining means.

4,627,400

PORTING SYSTEM FOR INTERNAL COMBUSTION ENGINE

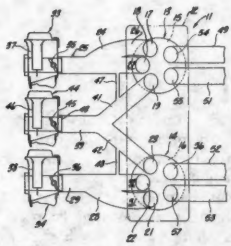
Toshihiko Takata, and Yoshiharu Nakayama, both of Hamamatsu, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 26, 1985, Ser. No. 759,602

Claims priority, application Japan, Jul. 27, 1984, 59-155470

Int. Cl.[4] F02B *15/00*

U.S. Cl. 123—432 **31 Claims**



1. In an internal combustion engine having a variable volume chamber comprising first, second and third intake passages each serving said chamber through respective first, second and third intake ports, a first charge former for supplying a fuel/air mixture to said chamber through said first and second intake passages, and a second charge former for supplying a fuel/air mixture to said chamber through said third intake passage.

4,627,401

HIGH-VELOCITY CARBURETOR FOR AN OTTO ENGINE

Burkhard Brandner, Werdohl; Helmut Schilly, Bergneustadt-Pernze; Albert Stübs, Lüdenscheid, and Dieter Stojek, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Atlas Fahrzeugtechnik GmbH, Werdohl and Ford-Werke AG, Cologne, both of Fed. Rep. of Germany

Filed Oct. 10, 1984, Ser. No. 659,430

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337261

Int. Cl.[4] F02M *7/24*

U.S. Cl. 123—439 **8 Claims**

1. A high velocity carburetor for an Otto engine, comprising:

(a) a suction pipe having a cross-sectional area;

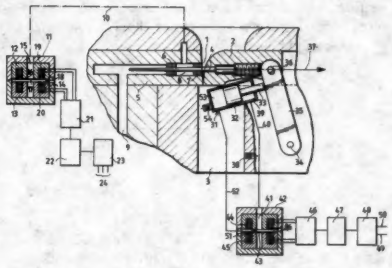
(b) a slide, and means for mounting said slide so as to change the cross-sectional area of said suction pipe;

(c) a nozzle connection having coaxially mounted therein apertured nozzle members in spaced relation so as to define therebetween an intermediate chamber;

(d) a profiled nozzle needle mounted on said slide and extending through the aperture of said nozzles, and means for axially moving said profiled nozzle needle relative to said nozzle members so as to form and variably control an annular gap between said nozzle needle and said nozzle members;

(e) a flow control valve for controlling the supply of air to the carburetor, said flow control valve having an outlet channel communicating with said intermediate chamber and an input channel connecting with atmospheric air, said control valve further having a freely movable, low inertia ferromagnetic membrane-like valve plate functioning as an electromagnetic core, and opposed electromagnetic cores for operating said valve plate in response to signal outputs;

(f) a pulse generator having push-pull outputs connected to said cores, said pulse generator having an adjustable pulse



duty factor and generating output signals which define the opening period of the flow control valve and thus the quantity of air supplied; and

(g) an address memory for controlling the pulse duty factor of said pulse generator, said address memory being addressed by operating load values, and speed and temperature values of the engine, said memory storing performance characteristic field information values for the pulse duty factor;

whereby the precise amount of air supplied to said intermediate chamber can be adjusted in accordance with said information values and consequently the pulse duty factor.

4,627,402

METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

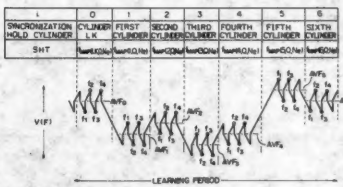
Kimitaka Saito; Kenzi Iwamoto, both of Nishio; Tsuneyuki Egami, Gamagori; Tsutomu Saito, Okazaki, and Takesi Matuyama, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 13, 1985, Ser. No. 797,815

Claims priority, application Japan, Nov. 14, 1984, 59-238590

Int. Cl.[4] F02B *33/00*

U.S. Cl. 123—440 **10 Claims**



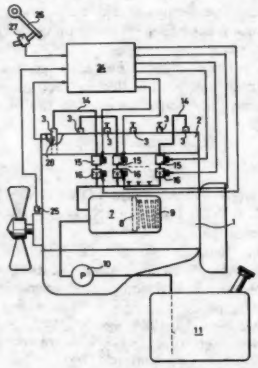
1. A method for controlling the air-fuel ratio in an internal combustion engine having a plurality of cylinders, comprising the steps of:

calculating a base fuel amount in accordance with predetermined parameters of said engine;
generating an air-fuel ratio signal of said engine;
selecting a cylinder from said cylinders;
sampling and holding said air-fuel ratio signal corresponding to said selected cylinder;
calculating an air-fuel ratio feedback amount in accordance with the sampled and held air-fuel ratio signal during a first predetermined engine state;
adjusting the actual air-fuel ratio in accordance with said base fuel amount and said air-fuel ratio feedback amount;
determining a cylinder on the leanest side by changing said selected cylinder during a second predetermined engine state; and
setting said cylinder on the leanest side as said selected cylinder during a state other than said second predetermined engine state.

4,627,403
FUEL INJECTION APPARATUS

Osamu Matsumura, No. 402, 1-29-9, Kamiochiai, Shinjuku, Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 668,143
Claims priority, application Japan, Dec. 27, 1983, 58-248659; Dec. 27, 1983, 58-248660
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—447 **9 Claims**

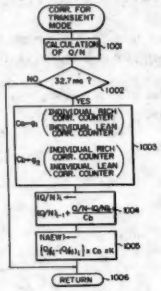


1. A fuel injection apparatus wherein fuel under pressure is supplied to an injecting nozzle for injecting a mist of fuel, said injection apparatus comprising:
(a) an accumulator for holding the fuel under pressure;
(b) a timing control valve for controlling the timing of the supply of fuel from said accumulator to said injecting nozzle;
(c) a quantity control valve for controlling the quantity of fuel injected by said injecting nozzle at one time, said quantity control valve being coupled to its respective injecting nozzle, and said quantity control valve controlling the effective area of the injecting hole of said injecting nozzle; and
(d) an electric control means for controlling said timing control valve and said quantity control valve in response to the number of revolutions and engine load.

4,627,404
METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

Kimitaka Saito, Okazaki; Tokio Kohama, Nishio; Tsuneyuki Egami, Nukata; Tsutomu Saito, Okazaki; Hiroshi Takahashi, Toyota, and Kunihiko Sato, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Nov. 28, 1984, Ser. No. 675,704
Claims priority, application Japan, Nov. 29, 1983, 58-223196
Int. Cl.[4] F02B *33/00*
U.S. Cl. 123—492 **31 Claims**



1. A method for controlling the air-fuel ratio in an internal combustion engine comprising the steps of:
calculating a base fuel amount in accordance with first predetermined engine operating parameters;
determining whether or not said engine is in a transient state;
detecting an air-fuel ratio deviation from the optimum air-fuel ratio for each of a plurality of regions, said regions being defined by predetermined ranges of values of a second engine operating parameter, said detecting only occurring when said engine is in a transient state;
calculating a transient fuel correction amount in accordance with said detected air-fuel ratio deviation for each region as defined by said second engine operating parameter; and
calculating a fuel amount to be supplied to said engine by correcting said base fuel amount in accordance with said calculated transient fuel correction amount.

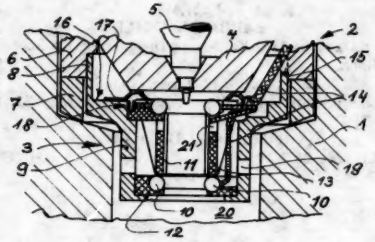
4,627,405
APPARATUS FOR INJECTING FUEL INTO COMBUSTION CHAMBERS

Ernst Imhof, Münchingen; Iwan Komaroff, Regensburg; Gunther Schmid, Stuttgart; Werner Grunwald, Gerlingen, and Helmut Reum, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE84/00073, § 371 Date Jan. 14, 1985, § 102(e) Date Jan. 14, 1985, PCT Pub. No. WO84/04567, PCT Pub. Date Nov. 22, 1984
PCT Filed Mar. 30, 1984, Ser. No. 699,977
Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317503; Aug. 2, 1983, 3327773
Int. Cl.[4] B05B *1/24;* F02M *23/14, 31/02*
U.S. Cl. 123—549 **24 Claims**

1. An apparatus for heating and injecting fuel-air into combustion chambers of self-igniting internal combustion engines, having a fuel injection nozzle for periodically injecting at least one aimed fuel spray through a passage of a combination air guide device and heating device, characterized in that the fuel being injected is accompanied by a flow of combustion air which is guided past the heating device and subsequently aspirated into said passage, said heating device further including at least two heating elements of different effectiveness, at

least one of said heating elements is a rapid-heating element for rapid heating the air prior to being aspirated for operating said



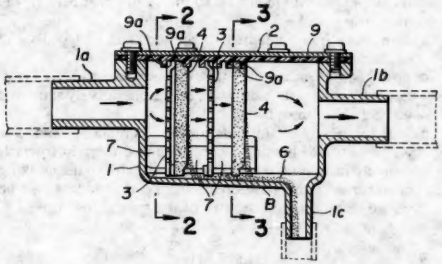
internal combustion engine in a cold state and at least one continuous-heating element for use during constant operation.

4,627,406

OIL SEPARATOR FOR RECYCLED BLOW-BY GAS

Kyoji Namiki, Urawa; Shunji Abe, Kawagoe; Shigeki Yamashita, Higashimatsuyama, and Yukio Kashiwaba, Saitama, all of Japan, assignors to Kabushiki Kaisha Tsuchiya Seisakusho, Tokyo, Japan

Filed Dec. 5, 1984, Ser. No. 678,466
Int. Cl.[4] F02B *25/06*
U.S. Cl. 123—573 12 Claims



1. An oil separator for recycled blow-by gas, comprising:

a casing having an inlet pipe for blow-by gas entrance, an outlet pipe for blow-by gas discharge, and an oil return pipe for separated oil discharge, said inlet and outlet pipes being located at first and second ends of said casing, respectively;

first and second perforated plates disposed within said casing, said first perforated plate being located nearer to said casing first end than said second perforated plate, said first and second perforated plates having first and second perforated sections, respectively, which are located opposite to each other with respect to a longitudinal axis of said casing;

first and second plate type filter members formed of a porous material and disposed within said casing, said first filter member being located between said first and second perforated plates, said second filter member being located nearer to said casing second end than said second perforated plate; and

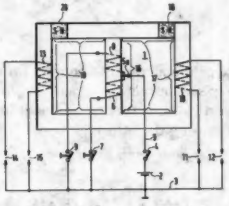
means defining a first space between said first perforated plate and said first filter member, and a second space between said second perforated plate and said second filter member, said second space being larger than said first space.

4,627,407

IGNITION COIL FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Dieter Betz, Vaihingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 684,092
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411844
Int. Cl.[4] F02P *3/02*
U.S. Cl. 123—634 6 Claims



1. Ignition coil, for a distributorless ignition system of an internal combustion engine, having

first (6) and second (8) primary windings;

first (10) and second (13) secondary windings, one each being associated with a primary winding;

means (7, 9) for selectively energizing one of said primary windings;

a unitary E-shaped core having a central branch defining a main core portion (16), on which the primary windings are wound, and two outer core branches defining secondary core portions magnetically coupled to the main core portion and located magnetically in shunt with respect to each other, and forming, with the main core portion (16), two parallel secondary magnetic circuits (17, 19),

each secondary core portion having a secondary winding (10,13) wound thereon,

wherein, in accordance with the invention,

a further crossbar core portion is provided, having two end each separated by a gap from one of said outer core branches, said crossbar core portion being disposed contiguous to said main core portion,

each secondary magnetic circuit (17, 19) is a ferro-magnetically continuous circuit and includes, in said gap between said crossbar core portion and said outer core branch a permanent magnet (18, 20) filling said gap, completing said magnetic circuit and polarized to apply a magnetic bias, to the respective magnetic circuit (17, 19), which bias is opposite to the magnetic field induced in the secondary magnetic circuit (17, 19) upon energization of

the selected primary winding (6,8) controlling generation of an ignition spark impulse from

the secondary winding (10,13) associated with said selected primary winding (6,8) and wound on the respective secondary core portion, which portion forms part of the respective secondary magnetic circuit (17,19).

4,627,408

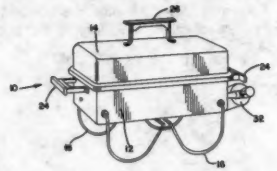
VAPORIZING ELEMENT FOR PORTABLE GRILL

Erich J. Schlosser, Lindenhurst, Ill., assignor to Weber-Stephen Products Co., Palatine, Ill.

Filed Jul. 24, 1985, Ser. No. 758,244
Int. Cl.[4] F24C *3/04*
U.S. Cl. 126—41 R 2 Claims

1. In a rectangular gas grill including a rectangular lower portion having a flat bottom wall and having a single elongated burner tube positioned centrally adjacent said bottom wall of said grill and a rectangular searing element having first and second inclined flat walls merging at an apex that is spaced above and axially aligned with said tube, said flat walls having

lower edges supported on said bottom wall to define a predetermined spacing between said tube and said apex, said flat walls having upwardly- and outwardly-deformed rectangular



tabs that produce elongated vent openings for accommodating flow of oxygen to said burner tube, said tabs covering said vent openings in a vertical direction of said grill to prevent grease drippings from passing therethrough.

4,627,409

COOKING APPLIANCE OF HOT AIR CIRCULATION TYPE

Yoshiteru Kagomoto, Kashihara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

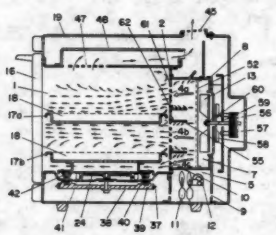
PCT No. PCT/JP83/00112, § 371 Date Dec. 9, 1983, § 102(e) Date Dec. 9, 1983, PCT Pub. No. WO83/03658, PCT Pub. Date Oct. 27, 1983

Continuation of Ser. No. 562,591, Dec. 9, 1983, abandoned. This PCT application Apr. 13, 1983, Ser. No. 782,607

Claims priority, application Japan, Apr. 14, 1982, 57-62727; Jul. 22, 1982, 57-128785

Int. Cl.[4] F24C *15/32*

U.S. Cl. 126—21 A **4 Claims**



1. A cooking appliance comprising

a heating chamber for storing a heating load;

a heating device for heating said heating load in said heating chamber;

a compartment adjacent said heating chamber;

fan means accommodated in said compartment for circulating hot air through said heating chamber and said compartment;

blow-out means for conducting into said heating chamber hot air which has been circulated by said fan means;

a partition plate separating said heating chamber from said compartment, said partition plate having blow-out ports defined by a multiplicity of openings divided into a plurality of groups disposed near the right and left ends of said partition plate;

a plurality of spaced substantially horizontal control plates partitioning said blow-out line means thereby separating the air reaching each of said groups of blow-out ports; and

barrier wall means abutting against each of said control plates and extending in the vertical direction from said blow-out ports, the ratio of the lengths of the portions of said barrier wall means above and below said blow-out ports being varied to control the blowing direction of hot air in the vertical direction.

4,627,410

BARBECUE GRILL

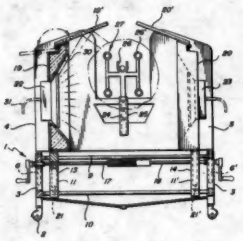
Kwan S. Jung, 54-18, 1-Ka, Myong Dong Chung-Ku, Seoul, Rep. of Korea

Filed Sep. 18, 1984, Ser. No. 651,861

Claims priority, application Rep. of Korea, May 31, 1984, 84-5282[U]

Int. Cl.[4] A47J *37/00, 37/04*

U.S. Cl. 126—25 A **13 Claims**



1. A cooking oven which comprises

a pair of opposing end walls,

a pair of opposing side walls containing radiating heating means, said side wall disposed inside of said end walls and defining, together with said end walls, a cooking chamber, said radiating heating means being surrounding by heat reflectors which are sloped to direct the heat toward the food being cooked,

a supporting frame adapted to support said end walls and said side walls,

opposing slider means mounted for movement on said supporting frame, said side walls being operatively mounted on said slider means, and

means for moving said slider means containing said side walls with said heating means mounted thereon towards or away from each other, whereby the size of the cooking chamber and the position of the heating means can be varied depending on the size of the food to be cooked.

4,627,411

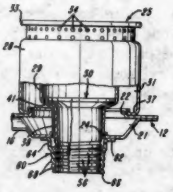
GAS BURNER AND MANIFOLD ASSEMBLY

Gary W. Mertler, 7916 N. Congress Park Dr., Dayton, Ohio 45459

Filed Dec. 4, 1984, Ser. No. 677,798

Int. Cl.[4] F24C *3/10*

U.S. Cl. 126—39 E **5 Claims**



1. In a gas burner assembly including a manifold having upper and lower sheet metal walls joined together to define a gas supply passage extending to an annular chamber, said upper and lower walls having means defining corresponding upper and lower openings for said chamber, a gas burner unit mounted on said manifold and having concentric inner and outer sheet metal walls defining an annular chamber, said outer

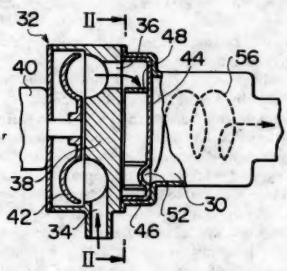
wall of said burner unit being seated on said upper wall of said manifold around said upper opening in said upper wall, said inner wall of said burner unit including an annular shoulder and a reduced tubular section projecting downwardly from said shoulder into said lower opening in said lower wall of said manifold for connecting said annular chamber within said manifold to said annular chamber within said burner unit, the improvement comprising a drawn sheet metal fitting including a flange portion projecting outwardly from a tubular portion, said flange portion seated on said annular shoulder, said tubular portion having a corrugated wall configuration in axial cross-section and defining helical threads, said tubular portion projecting downwardly from said flange portion within said tubular section of said inner wall of said burning unit, said tubular portion projecting through said lower opening within said bottom wall of said manifold, a drawn sheet metal nut member mounted on said fitting and including a polygonal portion extending downwardly from an outwardly projecting flange portion engaging said bottom wall of said manifold, and said nut member further including a tubular portion projecting downwardly from said polygonal portion and having a corrugated wall configuration in axial cross-section to form helical threads mating with said threads on said fitting for quickly and positively securing said burner unit to said manifold.

4,627,412

LIQUID FUEL COMBUSTION APPARATUS

Katsuji Sawada; Yoshiaki Kimijima, and Hidetoshi Umehara, all of Tochigi, Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,685
Int. Cl.[4] F24H *3/06*
U.S. Cl. 126—110 B **11 Claims**



1. In a vaporized liquid fuel combustion apparatus of the type including:

a cylinder defining a combustion chamber, said cylinder having an inlet end for receipt of combustion air and an outlet end for exhausting gaseous combustion products;

an end plate covering said inlet end of said cylinder;

a blower, including a rotor and a casing, for supplying combustion air to said combustion chamber, the improvement comprising:

a discharge port, formed in said end plate, for discharging air from the blower into the combustion chamber, said discharge port being offset with respect to the longitudinal axis of said combustion apparatus; and

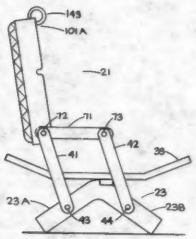
air deflector means for causing the air to exit said discharge port at an acute angle with respect to said end plate, said air deflector means defining a surface inclined at an acute angle with respect to said end plate, said inclined surface covering said discharge port.

4,627,413

THREE POSITION FIREPLACE COOKER

Gary Q. Watson, El Paso, Tex., assignor to ROCA Technologies, Inc., San Antonio, Tex.

Filed Oct. 29, 1985, Ser. No. 792,678
Int. Cl.[4] F24B *1/26*
U.S. Cl. 126—137 **31 Claims**



1. A heating and cooking apparatus, comprising:

a frame adapted to be supported by a base, said frame having first and second sides and rear and forward ends,

bar means supported by said frame for holding wood or the like to be burned,

a first set of rear and forward arms having lower ends pivotally coupled to said first side of said frame such that said first set of arms may be pivoted between rear and forward positions,

a second set of rear and forward arms having lower ends pivotally coupled to said second side of said frame such that said second set of arms be pivoted between rear and forward positions,

first link means having rear and forward ends pivotally coupled to the upper ends of said first set of rear and forward arms respectively forming a first movable support means movable between rear and forward positions,

second link means having rear and forward ends pivotally coupled to the upper ends of said second set of rear and forward arms respectively forming a second movable support means movable between rear and forward arms positions,

food support means having rear and forward ends,

the rear end of said food support means being pivotally coupled to the rear and upper ends of said first and second movable support means such that said food support means may be moved with said first and second movable support means between said rear and forward positions above said bar means and also may be pivoted:

(a) rearward relative to said first and second link means such that said forward end of food support means is located away from said first and second link means, and

(b) next to said forward ends of said first and second link means for supporting food.

4,627,414

STAND FOR SUPPORTING COOKING LIQUID SPRAY DISPENSER RELATIVE TO A HEATED SURFACE AND CONTROLLING THE TEMPERATURE OF THE LIQUID

Neal H. Chazin, 1305 Rexford Ave., Pasadena, Calif. 91107

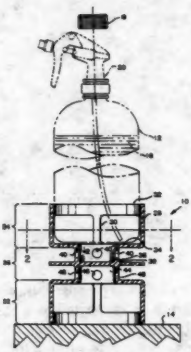
Continuation-in-part of Ser. No. 510,905, Jul. 5, 1983, abandoned. This application Dec. 7, 1984, Ser. No. 679,546
Int. Cl.[4] F24C *15/10*; A47G *23/02*
U.S. Cl. 126—215 **19 Claims**

1. A stand made of insulating material for supporting a spray dispenser of non-stick cooking liquid at a predetermined elevation above a heated surface to maintain the temperature of the liquid at a level at which it can be readily sprayed, said stand comprising:

an upper section adapted to receive and grip the spray dis-

penser, the upper section including a transverse bottom wall;

a base section adapted to rest on the heated surface, the base section being spaced from said upper section and including a transverse upper wall having a substantially horizontal outer surface; and



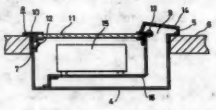
an intermediate section joining the transverse bottom wall of the upper section and the substantially horizontal outer surface of the base section, said intermediate section, said upper and base sections comprising open frame structures including cutaway portions defining generally vertically oriented struts joined at their outer ends by a ring defining chamber means opening into said upper and base sections.

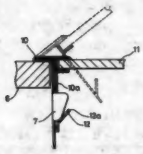
4,627,415

COOKING STOVE HAVING REMOVABLE TOP PLATE

Tetuo Kamo; Junichi Miyagawa; Kazuichi Okada, and Eiji Shiota, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 31, 1985, Ser. No. 794,783
Claims priority, application Japan, Nov. 2, 1984, 59-231512
Int. Cl.⁴ F24C *15/20*
U.S. Cl. 126—299 R **6 Claims**





1. A cooking stove comprising:

a box-shaped housing having an open top and sides;

a top plate removably mounted upon an upper portion of said housing such as to form an air inlet/outlet aperture between at least one end of said top plate and said housing, said top plate comprising a peripherally disposed frame which is of T-shaped cross-sectional configuration including an inner peripheral portion, an outer peripheral portion and at least one depending side wall, and a flat plate member which is fixedly retained within said inner peripheral portion of said frame, said outer peripheral portion of said frame being disposed upon said upper portion of said housing for supporting said top plate thereon;

first catch means formed on one of said sides of the interior of said housing, and second catch means formed on said side wall of said top plate, said first and second catch means being adapted to removably attach said top plate to said housing; and

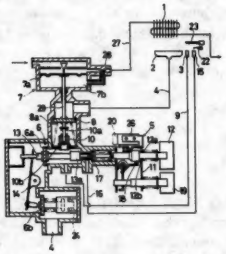
a cover member dimensioned to cover said air inlet/outlet aperture.

4,627,416

WATER HEATER

Hiroshi Ito; Kanae Aida; Masanobu Shinozaki; Masahiko Koumura; Kazumi Tamada, and Katsushi Mizutani, all of Nagoya, Japan, assignors to Rinnai Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 6, 1984, Ser. No. 586,603
Int. Cl.⁴ F23H *1/00*
U.S. Cl. 126—351 **3 Claims**



1. A water heater, comprising:

a heat exchanger for heating water from a water supply;

a main burner for heating said heat exchanger;

a standing burner proximal to said main burner for igniting the same;

a main fuel passage means for supplying fuel from a fuel supply to said main burner;

a manual valve on said main fuel passage means which is operable by a manual operation nember;

an automatic valve disposed in said main fuel passage means at a point downstream from said manual valve, a water pressure sensitive member disposed between said water supply and said heat exchanger, said automatic valve operable in response to the pressure of a supply of water at said water pressure sensitive member;

a standing burner fuel passage means for supplying fuel from said fuel supply to said standing burner, said standing burner fuel passage means drawing fuel from said main fuel passage means at a point between said manual valve and said automatic valve; and

a lock means attached to said water pressure sensitive member by an actuation rod, said lock means engageable with said manual operation member when a supply of water is sensed by said water pressure sensitive member for preventing said manual operation member from opening said manual valve and such that said lock means are not engaged with said manual operation member when no supply of water is sensed by said water pressure sensitive member and wherein said lock means is slidable with respect to said actuation rod and is biased toward said manual operation member, wherein said lock means comprises a flat face generally perpendicular to said operation rod, said lock means arranged to be engageable with a projection on said manual operation member for stopping the movement of said manual operation member when a supply of water is provided to said water pressure sensitive member;

wherein said manual operation member includes,

(a) a pushbutton inserted through an operation panel constituting a front surface of a main body of the water heater, said pushbutton having three positions, a starting end position, an intermediate position and a final end position, and

(b) an operation rod fixed to and extending from said pushbutton, said operation rod being partially disposed within said main fuel passage means,

and wherein said manual valve includes,

(a) a cut-off valve fixed to said operation rod said cut-off valve disposed within said main fuel passage for cutting off the supply of fuel through said main fuel passage, such that said cut-off valve is closed when said pushbutton, and therefore said operation rod, returns from said intermediate to said starting end position, and

(b) a safety valve disposed within said main fuel passage upstream from said cut-off valve for stopping the supply of fuel through said main fuel passage, said safety valve being operatively connected to said operation rod and responsive to movement of said operation rod, such that said safety valve is open when said pushbutton is at said final end position and is allowed to close when said pushbutton is returned to said intermediate position from said final end position.

4,627,417

STEAM PRESSURE COOKER

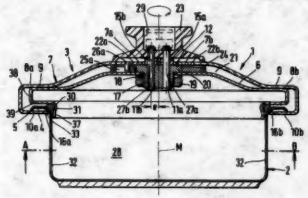
Reinhard von der Becke, Obere Rebhalde 21, CH-6340 Baar, Switzerland, and Horst Schultz, Bergmannweg 2, D-6230 Frankfurt am Main 80, Fed. Rep. of Germany

Filed Aug. 20, 1984, Ser. No. 642,373

Claims priority, application Switzerland, Aug. 25, 1983, 4699/83

Int. Cl.⁴ F24D *1/00*

U.S. Cl. 126—369 **35 Claims**



1. A steam pressure cooker having a pot and a cover unit for pressure sealing said pot by means of a ring-shaped sealing element in which said pot has a circular, smooth pot rim angled toward the outside, which pot rim from a top plan view has a continuous circular outer edge and said cover unit has a lower lid and an upper lid, said upper lid comprising half lids forming a sealing element where in said half lids are movable relative to the lower lid and said pot in a plane parallel to the plane of said pot rim to provide a locking position in which said upper rim section of said half lids are disposed over an outer rim portion of the lower lid and a lower flange of said combination of half lids encirles and engages under the pot rim in locking position wherein the improvement comprises said upper lid consisting of two half-lids in which both half-lids are centrally rotatably hinged relative to the lower lid and the pot about their own swivel axes which are essentially parallel to the central, vertical geometrical axis (M) of the pot, in which said swivel axes lie eccentrically to said central axis (M) of the pot and diametrically opposite each other relative to the central axis (M) and a swivel mechanism hinged in the middle of the lower lid for activating said centrally rotatably hinged half lids.

4,627,418

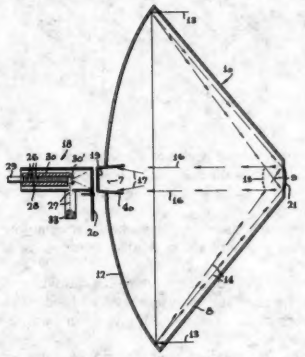
APPARATUS FOR THE CARBOTHERMIC REDUCTION OF METAL OXIDES USING SOLAR ENERGY

James O. Gibson, and Mark G. Gibson, both of Pacific Palisades, Calif., assignors to Geruldine Gibson, Santa Monica, Calif., a part interest

Division of Ser. No. 184,957, Sep. 8, 1980, Pat. No. 4,472,367, which is a continuation-in-part of Ser. No. 961,536, Nov. 17, 1978, abandoned. This application Jan. 16, 1984, Ser. No. 570,858

Int. Cl.⁴ F24J *3/02*

U.S. Cl. 126—438 **10 Claims**



1. Apparatus for the carbothermic reduction of a metal oxide to produce a metal carbide utilizing solar energy comprising:

(a) at least one reflective surface for collecting, reflecting and focusing collected solar radiation;

(b) a focal mirror in spaced relation to said reflective surface having a reflective face facing the reflective surface for receiving focused and reflected solar radiation from the reflective surface and for focusing such solar radiation received;

(c) a reaction chamber in spaced relation to said focal mirror for receiving focused solar radiation from said focal mirror;

(d) a transparent window on said reaction chamber through which the focused solar radiation can pass into the reaction chamber;

(e) a target area within said reaction chamber toward which the solar energy rays from the focal mirror are focused, said target area located beyond the focal point of the focused energy rays and positioned at a point where the rays diverge;

(f) means within the reaction chamber for delivering a homogeneous mixture of metal oxide and carbon to the target area;

(g) a Fresnel lens positioned in front of said transparent window of said reaction chamber along the focal pathway of solar radiation reflected from said focal mirror, for further focusing and concentrating the solar radiation, the Fresnel lens being isolated by the transparent window from the reaction taking place in the reaction chamber;

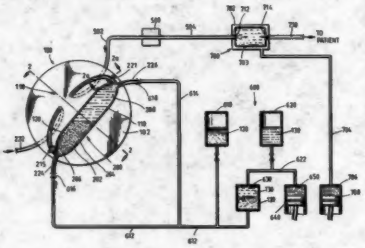
(h) means for providing a cooling fluid flow between the transparent window and the Fresnel lens; and

(i) means for revolving said transparent window so that a different portion of said transparent window is positioned to transmit focused solar radiation to the reaction chamber.

4,627,419
BLOOD PUMP APPARATUS AND METHOD

Brian A. Hills, Friendswood, Tex., assignor to The Board of Regents, The University of Texas, Austin, Tex.

Filed Aug. 29, 1984, Ser. No. 645,605
Int. Cl.[4] A61M *1/03*
U.S. Cl. 128—1 D 14 Claims

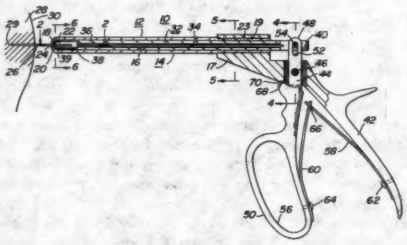


1. Apparatus for the pressure treatment of blood comprising:
(a) a flaccid chamber having an interior surface, exterior surface, an inlet for accepting blood, an outlet for expelling blood;
(b) a pressure housing including pressure applying means for applying pressure isotropically to blood in said flaccid chamber;
(c) means for introducing a physiologically inert fluid which is heavier than and immiscible with blood into said flaccid chamber so as to displace blood from said flaccid chamber; and
(d) means for rotating said flaccid chamber in order to change the orientation of the inlet and outlet with respect to one another.

4,627,420
NEEDLE INSERTING INSTRUMENT FOR INTERSTITIAL RADIOTHERAPY

Harry R. Katz, 10121 Darmuid Green Dr., Potomac, Md. 20854

Filed Oct. 31, 1983, Ser. No. 547,250
Int. Cl.[4] A61N *5/12*
U.S. Cl. 128—1.1 12 Claims

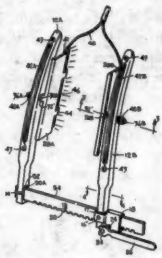


1. An instrument for inserting a hollow needle into a body for interstitial radiotherapy comprising a unit having an elongated portion with an opening therethrough and a handle portion, a tubular element received within the opening of the unit and having an opening means for slidably receiving therein a needle to be implanted into a body, the element being movable in a linear direction along the opening of the unit between first and second positions and having means for engaging and securing against slidable movement a needle received within its opening means when the element is in its first position, and actuating means comprising a lever pivotally secured with the handle portion of the unit having a first end proximate to the handle portion for manual actuation and a second end which engages the element and is movable with the actuation of the first end of the lever for linearly moving the element between its first and second positions and normally retaining the element in its second position.

4,627,421
STERNAL RETRACTOR

Panagiotis N. Symbas, 3661 Cloudland Dr., Atlanta, Ga. 30327; J. Lee Baisden, 5010 Timber Lookout, San Antonio, Tex. 78250, and Stothe P. Kezios, 1060 Winding Creek Trail, N.W., Atlanta, Ga. 30327

Filed Aug. 3, 1984, Ser. No. 637,419
Int. Cl.[4] A61B *17/02*
U.S. Cl. 128—20 10 Claims

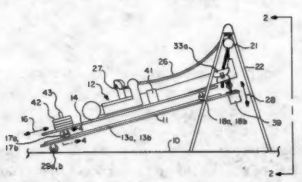


1. Apparatus for spreading the walls of an opening in the body of a human or other animal comprising:
a cross-bar;
two elongate arms, each of said arms having a free end and an end pivotally mounted to said cross-bar;
means for moving the pivoting end of one of said arms laterally along said cross-bar; and
means mounted on each of said arms for engaging the walls of an opening.

4,627,422
VARIABLE TRACTION APPARATUS AND METHOD

Thomas J. Bates, 120 Hillcrest Rd., Berkeley, Calif. 94706

Filed Oct. 24, 1985, Ser. No. 790,811
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—71 8 Claims



1. Apparatus for applying variable traction to a person having a predetermined height comprising:
an elongated base having track means in the elongated direction and having a length in said direction longer than said height of said person;
a traction bed including a flat elongated surface for allowing said person to recline thereon, said bed being mounted for slidable movement in said elongated direction on said track means of said base and substantially parallel to and coextensive with said base;
means for controllably lifting an end of said base and said associated traction bed and maintaining at a selected inclination;

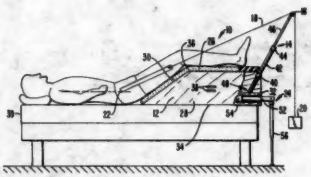
means for tethering an extremity of a said person reclining on said traction bed to said lifted end of said base.

4,627,423

PORTABLE TRACTION DEVICE

Stanley L. Kampner, 1270 Armsby St., Hillsborough, Calif. 94010

Filed Sep. 10, 1984, Ser. No. 649,091
Int. Cl.[4] A61H *1/02*; A61F *5/00*
U.S. Cl. 128—75 14 Claims



1. A self-contained traction device for use on a bed comprising:

a platform having a flat bottom surface and an upper surface which includes a portion inclined relative to said flat bottom surface, said inclined portion at its lowest point joining said bottom surface, said inclined portion having a width sufficient to support a portion of a person's body to be placed in traction, said platform having a length less than the length of said bed;

a pulley mounted to said platform proximate an upper end of said inclined portion; and

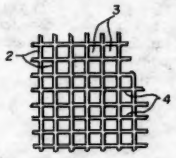
flexible cable means looped over the pulley having a first end proximate the inclined portion and attached to the person's body and a second end connected to a weight.

4,627,424

COLD WATER CURABLE ORTHOPEDIC CAST

Kenneth S. Baron, San Ramon, and David W. Wood, San Francisco, both of Calif., assignors to Hexcel Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 322,657, Nov. 18, 1982, Pat. No. 4,427,002. This application Jun. 8, 1983, Ser. No. 502,280
The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—83 9 Claims



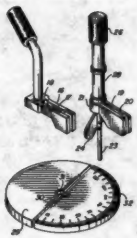
1. A bandage material for forming in place an orthopedic cast comprising a pliant, large mesh fabric carrier formed from a knot of a high-strength, high-modulus fiberglass yarn with a low moisture pick-up, the fabric carrier having openings of relatively large transverse dimension, and being coated with a polymer composition comprising (a) a water curable polyurethane prepolymer comprising the reaction product of a polyalkylene ether diol, a polyalkylene ether triol and a diisocyanate, wherein the ratio of diol to triol is from 1:9 to 9:1 and (b) an amine catalyst.

4,627,425

OSTEOTOMY APPLIANCES AND METHOD

H. William Reese, 1450 S. Dobson, Suite 201, Mesa, Ariz. 85202

Continuation-in-part of Ser. No. 536,782, Sep. 28, 1983, abandoned. This application Apr. 16, 1984, Ser. No. 601,069
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 VY 3 Claims



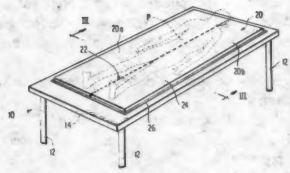
1. An osteotomy appliance for the precision location of a second bone cut in angular relation to a first bone cut for use on a bone having a hole drilled therein substantially at the intersection of the two cuts to be made therein, said appliance comprising a pin member adapted for placement in said hole, a follower extending radially outwardly from said pin member and adapted to be positioned in said first saw cut, a saw guide extending radially outwardly from said pin member, said saw guide and said follower being angularly movable with respect to each other about the axis of said pin member, and a handle extending axially from said pin member and adapted to be grasped for manipulation of the appliance, said handle being threadably connected to said pin member for releasably tightening said follower and said saw guide together in predetermined angular relationship.

4,627,426

TEAR-AWAY STERILE AND ABSORBENT SHEET FOR OPERATING TABLE USE

Jack Wegener, Gloucester, N.J.; Raynor A. Johnson, Newark, Del., and Robert Weedling, Stockertown, Pa., assignors to American Industrial Research, Inc., Newark, Del.

Filed May 17, 1985, Ser. No. 735,233
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—132 R 8 Claims



1. A tear-way sterile absorbent material operating table sheet for operating table use, said absorbent material sheet being adapted for placement in an overlying position on the top of an operating table and between a patient centered longitudinally and laterally thereon and the table top, the improvement wherein said sheet is of a length on the order of the length of the patient and is of a width in excess of the width of the patient and comprises:

two separable sheet sections joined along a longitudinal centerline underlying and in line with the patient supported thereby by a weakened line extending longitudinally through the longitudinal centerline of said sheet,

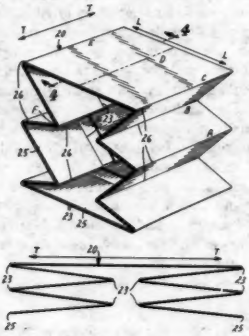
such that said sheet sections may be removed by tearing of the sheet along the weakened line from one end to the other by lateral pulling of the sections apart to effect separation and removal from beneath the patient, without moving the patient relative to the table top.

4,627,427

UNIVERSAL MEDICAL COVER SHEET AND PROCESS FOR DRAPING

Judith A. Arco, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 17, 1984, Ser. No. 661,688
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—132 D **19 Claims**



1. An article adaptable for draping non-surgical areas of patient and providing a surgical zone during an invasive medical procedure comprising draping material having opposing side edges of substantially equal length and a surgical zone integrally associated with the draping material, the article being formed in a closed loop and being dimensioned such that opening of the loop yields a surgical cover sheet wherein the surgical zone is positioned within the draping material so that non-surgical areas of the patient are covered sufficiently for surgical purposes by draping material when the surgical zone is placed to permit access to the body area involved in the procedure.

19. A process for draping a patient for an invasive medical procedure comprising:

providing a closed loop article comprised of draping material and a surgical zone integrally associated with the draping material;

opening the loop along a line distanced an appropriate length from the surgical zone to create a cover sheet with the surgical zone positioned within the draping material between the surgical zone and the respective ends of the cover sheet so as to provide lengths of draping material adequate to sufficiently cover non-surgical areas of the patient when the surgical zone is placed to permit access to the body area involved in the procedure; and

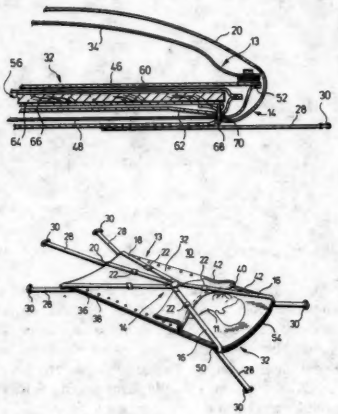
positioning the cover with respect to the patient so that the surgical zone is placed to permit access to the body area involved in the procedure and adequately cover the non-surgical areas of the patient.

4,627,428

CHILD RESTRAINT DEVICE WITH REMOVABLE SEMI-RIGID SUPPORT

David A. Brooks, 165 LaRose Avenue, Suite 106, Weston, Ontario, Canada M9P 3S9

Continuation-in-part of Ser. No. 619,018, Jun. 11, 1984, abandoned. This application Aug. 17, 1984, Ser. No. 641,877
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—135 **12 Claims**



1. A child safety restraining apparatus for restraining a child in a substantially flat position relative to a medical transporting device, comprising:

child support means including a semi-rigid base comprising upper and lower layers of material joined along or adjacent side edges thereof to provide a pocket between the layers of material which is open at one end, the lower layer of material having a plurality of apertures located at predetermined locations therein, a semi-rigid support member insertable into the pocket through the open end, said support member including fastening members secured to the lower surface thereof at predetermined positions which correspond to the location of the apertures in the lower layer of material such that each of the fastening members extends through a corresponding aperture when the support member is inserted in the pocket; said child support means further including a cover attachable to the upper layer of material to protectively secure the child between the upper layer of material of the base and the cover; and

restraining means connectable to the fastening members of the child support means to secure the child support means to the transporting device whereby movement of the child support means relative to the transporting device is restrained.

4,627,429

STORAGE-STABLE TRANSDERMAL ADHESIVE PATCH

Andrew G. Tsuk, Clinton, N.Y., assignor to American Home Products Corporation, New York, N.Y.

Filed Feb. 28, 1986, Ser. No. 834,255
Int. Cl.[4] A61L *15/00*
U.S. Cl. 128—156 **1 Claim**

1. A storage-stable transdermal adhesive bandage structure comprising:

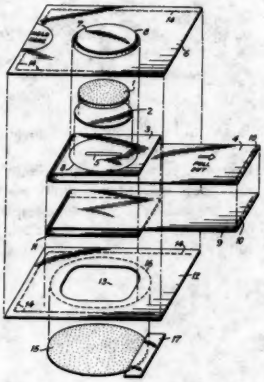
(a) a first pull tab having an upper surface and a heat-sealable film laminate lower surface and being folded over such that a portion of the lower surface is upwardly facing, said

pull tab having disposed on the upwardly facing lower surface;

(b) a matrix having a medicinal formulation incorporated therein said matrix being small in area than the upwardly facing lower surface of the pull tab;

(c) an occiusive film adhesively bonded to the matrix and situated between the upwardly facing lower surface of the pull tab and the lower surface of the matrix, said film extending outwardly from the periphery of the matrix;

(d) a cover having a heat-sealable film laminate lower surface covering the occlusive film and being heat-sealably bonded to the heat-sealable upwardly facing lower surface of the pull tab surrounding the occlusive film;



(e) a second pull tab having an upper adhesive release surface folded under such that the upwardly facing adhesive release surface is coextensive with the lower surface of the first pull tab, said first and second pull tabs being fastened together at the extremity opposite the fold;

(f) a release liner having upper and lower surfaces coextensive with the cover and being fastened along its periphery to the cover, the release liner having an ipening therein larger in area than the occlusive film covering the matrix;

(g) a non-occlusive adhesive film covering the opening in the release liner and extending outwardly from the periphery of the opening, and said peripherally extending film portion being adhesively bonded to the lower surface of the release liner.

4,627,430

INHALATOR APPARATUS

Hans U. Klimt, Rufenbergweg 14, D-7912 Weissenhorn-Bubenahusen, Fed. Rep. of Germany

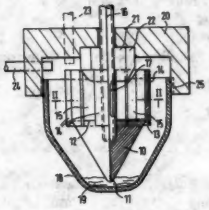
Filed Apr. 22, 1985, Ser. No. 725,426

Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419148

Int. Cl.[4] A61M *11/00*

U.S. Cl. 128—200.17 **20 Claims**

1. In an inhalator apparatus comprising a container for holding a liquid inhalant, a suction cone having an upper peripheral edge and a lower tip and mounted within said container such that said tip would be submerged in said liquid inhalant, means connected to said suction cone and extending through said container for rotating said suction cone about its axis rotated by an electric motor, an air inlet into said container, and an aerosol outlet from said container for discharging a mixture of liquid inhalant and air in the form of a fine mist, the improvement comprising a radial blower having a plurality of vanes (14) extending upwardly and radially from said peripheral edge (12) of said suction cone (10), said vanes (14) defining a hollow cylinder comprising longitudinal sections divided by longitudinal slots (15) of the hollow cylinder, said longitudinal sections being integral with said peripheral edge (12) and said longitudinal slpts (15) extending to said peripheral edge (12), said vanes (14) having inner surface sides displaced inwardly from said peripheral edge (12) toward the axis of said suction cone (10), and said vanes (14) having undersides (13) adjacent said peripheral edge (12) projecting below said peripheral edge (12)



toward said tip (11) of said suction cone (10) and defining divergent surfaces in continuously increasing distance from the outer surface of said suction cone (10), said radial blower attached to said suction cone (10) and adapted to be rotated therewith, and said air intake communicating with the sapce enclosed by said vanes (14) of said radial blower.

4,627,431

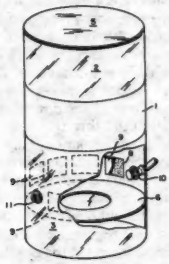
PROTECTIVE HOOD WITH CO_2 ABSORBENT

Bertil Werjefelt, Kailua, Hi., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 12, 1985, Ser. No. 710,670

Int. Cl.[4] A62B *7/00*

U.S. Cl. 128—201.25 **13 Claims**



1. A hood for providing the user of the hood with breathable air, the hood comprising:

(a) a generally tubular portion having open upper and lower ends and a substantially non-perforated continuous sidewall having inner and outer side surfaces, the generally tubular portion being comprised of a substantially gas-impermeable film;

(b) a generally circular hood portion comprised of the gas-impermeable film, the circular hood portion being connected to the upper end of the tubular portion;

(c) a substantially annular, resilient neck seal attached to the inner side portion of the lower end of the tubular portion, the neck seal having an opening for permitting at least the head of the user into the hood to form a closure around the user; and

(d) CO_2 absorption means disposed interiorly of the hood, a semi-permeable membrane retaining said CO_2 absorption means against a non-perforated portion of the inner surface of said tubular portion, the membrane having a porosity sufficient to retain the CO_2 absorption means out of

contact with the user and allow CO_2 and moisture to pass through the membrane.

4,627,432

DEVICES FOR ADMINISTERING MEDICAMENTS TO PATIENTS

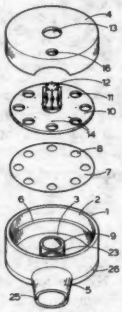
Robert E. Newell, Pinner, and Robert A. Fitzsimmons, Eggle-stone, both of England, assignors to Glaxo Group Limited, London, England

Filed Oct. 7, 1983, Ser. No. 540,203

Claims priority, application United Kingdom, Oct. 8, 1982, 8228887; May 24, 1983, 8314307

Int. Cl.[4] A61M *15/00*

U.S. Cl. 128—203.15 **10 Claims**



1. A device for administering to patients medicaments contained in a plurality of containers arranged in a circle on a carrier, the said device being charactered by a housing with a chamber therein, an air inlet into the chamber, a circular disc having an axis substantially coaxial to the chamber axis and rotatable inside the chamber and provided with a plurality of apertures therethrough arranged in a circle, said apertures being sized and positioned so that each aperture is adapted to be aligned with a different container, the said disc being arranged so that the carrier can be placed in contact with one face of the disc with one of the containers located in each one of the apertures, an outlet through which a patient may inhale leading out of the chamber, an opening in said housing alignable with respective ones of the apertures in the disc as the disc is rotated, a plunger operatively connected to said housing and having a penetrating member, said penetrating member being displaceable to pass through said opening and the corresponding aperture in the disc registered with it thereby to penetrate and open a container located in the aperture so that the medicament will be released from the container and entrained in the air flow produced by a patient inhaling through the outlet, and means between said disc and said housing for rotatably indexing the disc to register each of the apertures in turn with the housing opening.

4,627,433

TRACHEOSTOMY DEVICE

Edgar M. Lieberman, 210 Westport Rd., Kansas City, Mo. 64111

Division of Ser. No. 674,243, Nov. 23, 1984, Pat. No. 4,596,248. This application Mar. 3, 1986, Ser. No. 835,760

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—207.16 **2 Claims**

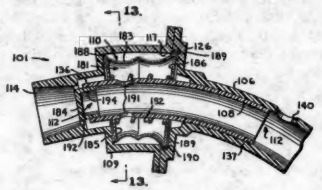
1. A tracheostomy device for insertion into a trachea and allowing a human patient to speak during a ventilation process; said device comprising:

(a) an outer cannula having a first end and a second end; said outer cannula having a fenestration therethrough; said fenestration adapted to be located within a patient's trachea;

(b) sealing means for forming a seal with a wall of the trachea and surrounding a portion of said outer cannula second end;

(c) an inner cannula slidably received in said outer cannula and having a first end and a second end; said inner cannula having an orifice therethrough near said first end thereof;

(d) a housing defining a chamber connected to said outer cannula second end; said housing chamber including



means adapted to be in flow communication with an air source; and

(e) dual valve means responsive to a patient's inhalation and exhalation process so as to selectively permit and inhibit flow of air from said air source while respectively inhibiting and permitting flow of air through said outer cannula fenestration

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4,627,434

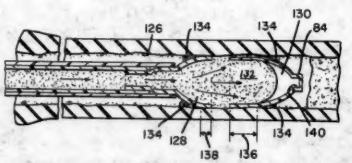
BONE CEMENT SYSTEM AND METHOD

William M. Murray, 145 Bryce Rd., Camp Hill, Pa. 17011

Filed May 3, 1985, Ser. No. 730,379

Int. Cl.[4] A61B *17/00*

U.S. Cl. 128—303 R **18 Claims**

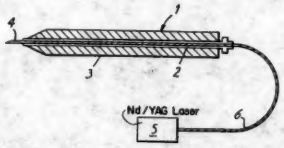


1. An intramedullary canal plug including a base imperforate to bone cement and an umbrella-type cement shield extending from the base, the shield comprising a plurality of ribs joined at one end to the base, circumferentially spaced around the base and extending outwardly of the base to a shield lip and a plurality of flexible sheeting portions each extending between adjacent ribs from the base to the shield lip, each sheeting portion including a first relatively more flexible part near one adjacent rib and a second relatively less flexible part near the other adjacent rib whereby upon collapse of the shield the first sheeting parts fold inwardly before the second sheeting parts fold inwardly.

4,627,435
SURGICAL KNIVES

William J. Hoskin, Harpenden, United Kingdom, assignor to MICRA Limited, Luton, United Kingdom

Filed May 14, 1984, Ser. No. 610,169
Claims priority, application United Kingdom, May 14, 1983, 8313374
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 16 Claims

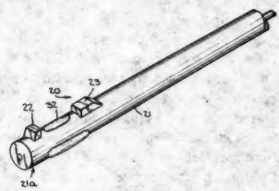


1. A surgical knife comprising:
a diamond blade,
a holder mounting said blade, and
means carried by said holder and coupled to the blade for heating the blade.

4,627,436
ANGIOPLASTY CATHETER AND METHOD FOR USE THEREOF

Michael E. Leckrone, Indianapolis, Ind., assignor to Innoventions Biomedical Inc., Indianapolis, Ind.

Filed Mar. 1, 1984, Ser. No. 585,112
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 16 Claims

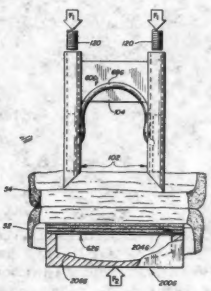


1. A catheter device for use in removing undesired material from a duct within a patient's body comprising a catheter having a proximal end portion and a distal end portion adapted to be inserted within a duct in the patient's body;
means disposed adjacent the distal end portion of the catheter for intersecting and releasing undesired material from the interior of the duct in a patient's body when the distal end portion of the catheter is disposed adjacent to the undesired material, said means comprising a first and a second abutment extending radially from the outer surface of the catheter and spaced apart from one another along the length of the catheter with the second abutment disposed adjacent the distal end portion thereof, the first and second abutments being adapted to form a chamber therebetween when the first and second abutments are urged against the inner surface of the duct, and a laser delivery means extending within the interior of the catheter from the proximal end portion thereof to between the first and second abutments to deliver laser energy across the chamber formed by the first and second abutments and toward the second abutment adjacent the distal end of the catheter when the laser delivery means is connected to a source of laser energy, the second abutment preventing the laser energy from impinging on the inner surface of the duct,
an inflatable bladder mounted on the catheter adjacent the distal end portion thereof disposed substantially opposite the intersecting and releasing means, and
means for controllably inflating the bladder when the device is disposed in a duct to enable the inflated bladder to contact the inner surface of the duct and urge the distal end portion of the catheter, including the first and second abutments, against the inner surface of the duct adjacent thereto,
whereby the means for intersecting and releasing the undesired material is positioned adjacent to the inner surface of the duct.

4,627,437
METHOD OF APPLYING A FASTENER TO TISSUE WITH A PAIR OF HOLLOW NEEDLES

James J. Bedi, Stockton; Donald M. Golden, Cherry Hill, both of N.J., and William P. McVay, Clearwater, Fla., assignors to Ethicon, Inc., Somerville, N.J.

Continuation of Ser. No. 506,146, Jun. 20, 1983, abandoned.
This application Jun. 5, 1985, Ser. No. 741,404
Int. Cl.[4] A61B *17/10*
U.S. Cl. 128—334 C 1 Claim



1. A method for applying a fastener to close a wound or incision in mammalian tissue by holding together portions of said tissue defining the wound or incision so as to facilitate healing of the wound or incision, said fastener being of the type comprising at least a fastening member and a receiver, said fastening member having a pair of legs joined by a link, said receiver being adapted to receive at least portions of said fastening member legs so that said fastener can remain in said tissue portions with at least a portion of said link lying substantially against one of said tissue portions on a first side of the wound or incision, with the receiver lying against other of said tissue portions on a second side of the wound or incision and with at least a portion of each of said legs being received in said receiver and being secured thereto, said method comprising the steps of:
(a) approximating said tissue portions in generally face-to-face relationship;
(b) providing a pair of spaced-apart needles, that are oriented in generally parallel planes, each needle having a distal end adapted for piercing said tissue portions, each needle being hollow and having a passage extending along its length from a fastener receiving opening to a discharge opening a said distal end, and each said needle defining a slot extending along its length in communication with said passage and facing the slot in the other needle;
(c) providing an anvil to hold at least said receiver adjacent said other tissue portion on said second side of said wound or incision;
(d) placing a leg guide member on said anvil;
(e) placing said receiver on said leg guide member;
(f) moving said anvil toward said needles to urge said receiver against said other tissue portion;

(g) inserting said needles through said approximated tissue portions to

(1) locate said receiving openings on said first side of said wound or incision, and

(2) locate at least portions of said discharge openings on said second side of said wound or incision;

(h) before, during, or after step (g), loading said fastening member into said needles through said receiving openings with

(1) each of said legs being disposed in one of said needle passages and

(2) said link extending through said needle slots between said needles;

(i) urging said fastening member along said needles to

(1) locate at least a portion of said link on said first side of said wound or incision adjacent said one tissue portion, and

(2) locate and secure at least a portion of each said leg on said second side of said wound or incision adjacent said other tissue portion; and

(j) withdrawing said needles from said tissue portions whereby the fastener remains holding together said tissue portions.

4,627,438

ELECTRONIC MIGRAINE MODULATOR APPARATUS AND METHODOLOGY

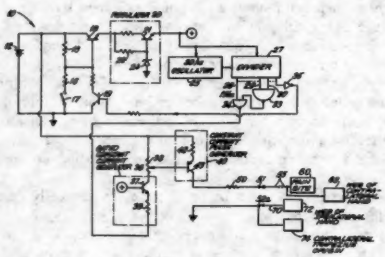
Saul Liss, and Bernard Liss, both of Glen Rock, N.J., assignors to Pain Suppression Labs, Inc., Elmwood Park, N.J.

Continuation-in-part of Ser. No. 569,476, Jan. 9, 1984, Pat. No. 4,550,733. This application Aug. 13, 1984, Ser. No. 640,104

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 R **3 Claims**



1. Electronic migraine modulator apparatus and methodology for employing a transcutaneous electronic wave to reduce and control migraine headaches, first positive contact electrode means being placed at the pain site and a second positive contact means is placed at the web of the contra-lateral hand; a first negative contact is placed at the contra-lateral trapezius origin, and a second negative contact electrode means is placed at the web of the ipsilateral hand, and means for supplying an electronic current wave comprising a high frequency electrical wave bearing a low frequency amplitude modulation to said first and said second electrode.

4,627,439

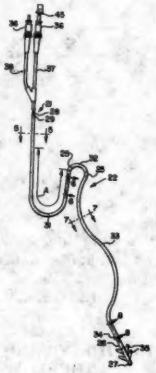
PREBENT VENTRICULAR/ATRIAL CARDIAC PACING LEAD

Donald L. Harris, Key Largo, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 561,648, Dec. 15, 1983. This application Nov. 16, 1984, Ser. No. 672,334

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—419 P **12 Claims**



1. A ventricular/atrial prebent lead for cardiac pacing or diagnosis, comprising:

a preshaped, prebent elongated flexible polymeric material insulating sheath having a distal end portion and a proximal end portion structured for connecting engagement with pacing equipment;

a multifilar coil encased within said preshaped, prebent elongated flexible sheath, said multifilar coil having a plurality of coaxially wound coil conductors alternately interwound with each other, each said coil conductor being insulated, each said coil conductor having a proximal end for electrically conductive engagement with the pacing equipment, and each said coil conductor having a distal end along an unbranched length of the preshaped, prebent elongated sheath, at least one of said distal ends defining an atrial coil conductor having a length shorter than at least one other coil conductor having its distal end defining a ventricular coil conductor;

an electrically conductive ventricular electrode at the distal end portion of said single unbranched length of the preshaped, prebent elongated sheath, said ventricular electrode being in electrically conductive communication with the distal end of said ventricular coil conductor;

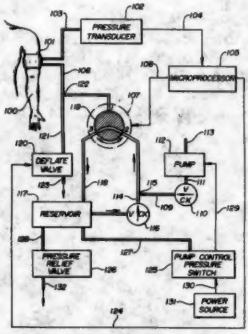
an electrically conductive atrial electrode at an atrial location along said single, unbranched length of the preshaped, prebent elongated sheath, said atrial location being between the proximal end portion and the distal end portion of the sheath and being positioned for engaging an atrial portion of a heart within which the lead is implanted, and said atrial electrode is in electrically conductive communication with said shorter length atrial coil conductor; and

wherein said unbranched length of the prebent elongated flexible polymeric material sheath includes a flexible enhanced stiffness section that is made of a polymeric material which is stiffer than the polymeric material out of which the remainder of the unbranched length is made, said flexible enhanced stiffness section having an outer diameter substantially the same as that of the remainder of the unbranched length.

4,627,440
SPHYGMOMANOMETRIC CUFF PRESSURIZING SYSTEM

Maynard Ramsey, III; James M. Muskatello; Rush W. Hood, Jr., all of Tampa; Richard Medero, Lutz, and Stanley K. Stephenson, Tampa, all of Fla., assignors to Critikon, Inc., Tampa, Fla.

Filed Jul. 5, 1985, Ser. No. 751,835
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—682 19 Claims



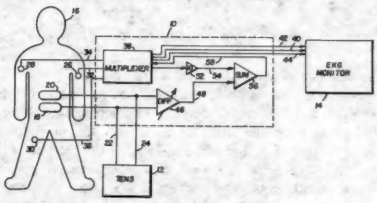
16. Blood pressure measuring apparatus comprising:
(a) an inflatable and deflatable pressure cuff;
(b) means defining a pneumatic reservoir;
(c) a pneumatic pump;
(d) first valve means interconnecting said pump and the interior of said reservoir means for selectably supplying air under pressure from said pump to said reservoir means to pressurize said reservoir means;
(e) second valve means interconnecting said reservoir means and said cuff for selectably establishing air transfer communication between said reservoir means and said cuff to cause a rapid inflation of said cuff;
(f) means coupled to said cuff for sensing cuff pressure;
(g) deflate valve means coupled to said cuff for releasing air from said cuff; and
(h) means coupled to said first and second valve means for controlling the operation thereof to inflate said cuff upon initiation of a blood pressure measuring cycle,
(i) wherein said first and second valve means are constituted by a single multi-position valve mechanism having a first position for coupling an outlet of said pump to the interior of said reservoir means, and having a second position for coupling said reservoir means to said cuff.

4,627,441
B MEDICAL MONITORING CIRCUIT

Eric A. Martin, St. Anthony, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 604,797, Apr. 27, 1984. This application Nov. 6, 1985, Ser. No. 795,553
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—696 4 Claims

1. Medical monitoring circuit for use in conjunction with an electrical stimulator of the type which includes two stimulating electrodes which are attached to a human body and which provides an electrical output to said stimulating electrodes by which means an electrical potential difference is applied to said human body and for use with a monitoring device of the type which includes two monitor inputs and a monitor ground input, and which displays the potential difference between signals applied to the said two monitor inputs and for use in conjunction with first, second and third sensing electrodes coupled to said human body at three different locations, said monitoring circuit comprising:
circuit ground means for coupling to said third sensing electrode and for providing a reference ground;
first input means coupled to said circuit ground means for coupling to said first sensing electrode and for generating a first signal indicative of the electrical potential difference between said first sensing electrode and said circuit ground;
second input means coupled to said circuit ground means for coupling to said second sensing electrode and for generating a second signal indicative of the potential difference between said second sensing electrode and said circuit ground, whereby the electrical potential difference between said first and second signals is a result both of electrophysiological activity of said body and of said electrical potential difference applied by said stimulating electrodes;
third input means coupled to said circuit ground means for coupling to said electrical stimulator and responsive to the



output of said electrical stimulator and for generating a third signal indicative of the electrical potential difference applied to said human body by said stimulating electrodes;
first output means coupled to said first input means for providing said first signal to one of said two monitor inputs of said monitoring device;
second output means coupled to said second and third input means for adding said third signal to said second signal and for providing the sum of said second and third signals to the other of said two monitor inputs of said monitoring device, said second output means including adjustment means for adjusting the amplitude of said third signal prior to adding said third signal to said second signal whereby said third signal may be appropriately adjusted such that the electrical potential difference between said second and third signals reflects only the electrophysiological activity of said human body; and
third output means coupled to said circuit ground means, for coupling said circuit ground means to said monitor ground input.

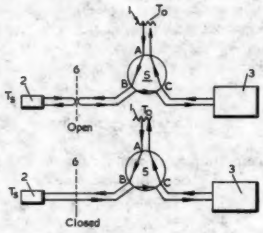
4,627,442
MICROWAVE THERMOGRAPHIC APPARATUS

David V. Land, Glasgow, Scotland, assignor to The University Court of the University of Glasgow, Glasgow, Scotland

Filed Jan. 10, 1984, Ser. No. 569,661
Claims priority, application United Kingdom, Jan. 12, 1983, 8300779
Int. Cl.[4] A61N 1/04
U.S. Cl. 128—736 4 Claims

1. Apparatus for use in microwave thermography, said apparatus comprising a signal-receiving aerial sensitive to microwave radiation emanating from a portion of a living-tissue body, said body having a mean body temperature and a mean tissue impedance and said aerial having an output for delivering a thermal noise signal representative of said microwave radiation, a single-throw on-off solid state diode microwave switch connected to said aerial output, a fixed-impedance reference load which is maintained at a predetermined temperature substantially equal to said mean body temperature and

said reference load having an output capable of emitting a thermal noise signal at microwave frequency corresponding to that predetermined temperature, a receiver having an input with an input impedance matched to the impedance of said reference load said receiver having an output and switchable detection means for establishing at said output the difference between the thermal noise signals delivered to the receiver input and emanating from said aerial and from said reference load, synchronous switching means connected to drive said



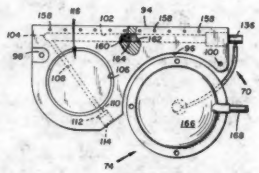
detection means and said solid-state diode microwave switch, a three-port non-reciprocal circulator interconnecting said aerial, reference load and receiver, said circulator having respective ports taken in circulation order connected to the noise-signal output of said reference load, to the output of the aerial via said single-throw on-off diode microwave switch, and to the receiver input, and adding means connected to the output of the receiver and to the output of the reference load for establishing a measure of the temperature of said body portion.

4,627,443

X-RAY READABLE IMPLANTABLE PRESSURE SENSOR

John G. Chubbuck, Silver Spring, and Melvin H. Epstein, Glyndon, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Oct. 29, 1980, Ser. No. 201,757
Int. Cl.[4] D61B *5/00*
U.S. Cl. 128—748 **10 Claims**



1. A biological pressure sensor for implantation at selected site within the body of a human subject comprising:

a housing plate, said plate having disposed therein a bellows recess and an elongated metering channel opening on one end thereof into said recess, said housing plate adapted to be fixedly secured to biological tissue;

a closed ended bellows for mounting in said bellows recess, the interior of said bellows communicating through an aperture disposed in a wall thereof to said bellows recess and therefore to the interior of said one end of said metering channel;

a pressure tube fixedly secured on one end thereof to the other end of said metering channel, said tube communicating with the interior of said metering channel;

a flexible tambour operably connected to the other end of said pressure tube, said flexible tambour for positioning at said selected site, the pressure of which is to be measured;

an X-ray detectable liquid disposed in said bellows and the interior of the adjacent portion of said metering channel; and

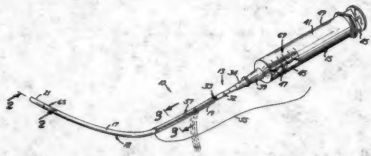
a second liquid immiscible with said X-ray detectable liquid disposed in said tambour, the interior of said pressure tube, and the balance of the interior of said metering channel not filled with said X-ray detectable liquid, said X-ray detectable liquid being relatively radiopaque in comparison to said second liquid, the interface between said liquids moving along the length of said metering channel in proportion to increases and decreases of said pressure.

4,627,444

DEVICE FOR SAMPLING TISSUES AND FLUIDS FROM BODILY CAVITIES

Doris C. Brooker, Eden Prairie, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jun. 20, 1985, Ser. No. 746,910
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—758 **16 Claims**



14. An apparatus for the collection of tissue and fluid samples from a bodily cavity having a cavity opening leading to a bodily passageway extending from the exterior to the bodily cavity including:

a curette comprising a first tubular member having a central curette passageway and having a distal end portion adapted for insertion into a bodily cavity to be sampled, said distal end portion having a curette opening open to the central curette passageway of the tubular member for sampling solids, said first tubular member having a length sufficient to be inserted through the bodily passageway into a bodily cavity such that with the distal end within such bodily cavity a proximal end thereof extends to the exterior of such bodily cavity;

means for attaching a proximal end of said aspirating curette to a vacuum producing means such that a vacuum may be formed in the central curette passageway to facilitate tissue and fluid sampling through the curette opening;

a tubular protective sleeve having a distal end and a proximal end encasing the distal end portions of said first tubular member to form an assembly and including means for sealing a provided sleeve opening of said protective sleeve adjacent the distal end of the protective sleeve for preventing contamination of the central curette passageway of the first tubular member from material entering the sleeve opening at the distal end of the protective sleeve, said first tubular member being slidable relative to the protective sleeve between a retracted position within the protective sleeve and a second position whereby the curette opening is positioned outwardly from the distal end of the protective sleeve within the bodily cavity, the means for sealing being disabled upon positive movement of the first tubular member relative to the protective sleeve to its second position, the first tubular member being slidably retractable into the protective sleeve prior to removal of the assembly from such bodily cavity in which it is inserted; and

the first tubular member and protective sleeve assembly having selectively disableable means for restraining the first tubular member and protective sleeve from unintentional axial movement which would extend the first tubular member beyond the protective sleeve, the means for restraining being disabled when the distal ends of the

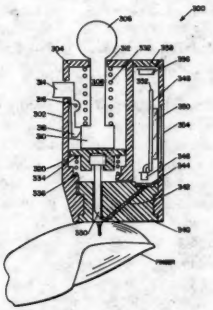
protective sleeve and tubular member are within such bodily cavity to permit the first tubular member to be moved to its second position.

4,627,445

GLUCOSE MEDICAL MONITORING SYSTEM

Fernando S. Garcia; Hartmut Ginnow-Merkert; Paul J. Anderson; David E. Linde, and Bertram J. Hudson, all of Eden Prairie, Minn., assignors to Garid, Inc., Eden Prairie, Minn.

Filed Apr. 8, 1985, Ser. No. 720,906
Int. Cl.[4] A61B 5/14
U.S. Cl. 128—770 8 Claims



1. Hand-held pocketable medical diagnostic system for extraction and qualitative analysis of a component of blood in a living body, comprising:

a. housing member including an internal spring actuating means surrounding a contained core means, said spring actuating means including an actuator spring, cocking means for said actuator spring, and means for releasing said actuator spring in response to a predetermined pressure against the skin of a body to move said core means, optical measurement means contained within said housing member, said optical measurement means including a light source and a light sensor in said housing member for measuring light emanating from said source, a blood reagent chemistry between said light source and said light sensor and having an optical characteristic responsive to the component to be measured and in contact with the blood to be measured, said optical measurement means generating an electrical signal proportional to light reflectance of said blood reagent chemistry and therefore also the component of the blood to be measured, display means in said housing member responsive to said electrical signal to provide a visual readout representative of the quantitative analysis, and socket means at one end of said housing member for removably receiving a disposable probe package;

b. disposable probe package shaped to be inserted into said socket means, including said blood reagent chemistry, means for supporting said blood reagent chemistry within said probe package, and a needle supported internal to said probe package below said core means and adjacent to said blood reagent chemistry; and,

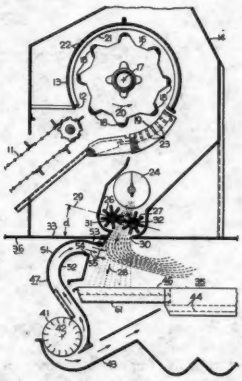
c. diaphragm means operatively connected to said needle and said blood reagent chemistry for causing vacuum action of said diaphragm means to transport the blood along said needle to said blood reagent chemistry for reaction therewith, thereby resulting in a color change yielding said reflectance of light which is read by said optical measurement means when said spring actuating means through said core means drives said needle through the skin.

4,627,446

DOWNWARDLY AND REARWARDLY DIRECTED AIR STREAM FOR HARVESTER WITH VERTICALLY OFFSET ACCELERATOR ROLLS

Michael L. Huhman, Kansas City, Mo., assignor to Deutz-Allis Corporation, Milwaukee, Wis.

Filed Mar. 14, 1985, Ser. No. 711,632
Int. Cl.[4] A01F 12/44
U.S. Cl. 130—27 Z 5 Claims



1. In an agricultural harvester having a threshing section with a threshing rotor disposed on a generally horizontal axis and a concave on the underside of said rotor, and a cleaning section having a grain pan below said concave and a sieve rearwardly of said grain pan, the combination comprising:

front and rear counterrotating accelerator rolls disposed above said grain pan and in underlying relation to said concave, said accelerator rolls being disposed on a pair of generally horizontal and parallel axes and receiving therebetween threshed material from said concave, the axis of said front accelerator roll being vertically offset above the axis of the rear accelerator roll whereby threshed material is accelerated in a downwardly and forwardly direction toward said grain pan, and

air delivery means including a lower duct directing a flow of air rearwardly and upwardly through said sieve and an upper duct having an outlet portion disposed a predetermined distance below and parallel to a plane through said axes of said accelerator rolls, said outlet portion directing a layer of laminar flow air rearwardly and downwardly toward said sieves, and through and transverse to the accelerated threshed material passing from said accelerator rolls thereby blowing chaff and stalk particles rearwardly from the kernels of grain which pass downwardly to said grain pan.

4,627,447

TOBACCO WINNOWING METHOD AND APPARATUS

Warren A. Brackmann, and Stanislav M. Snaidr, both of Mississauga, Canada, assignors to Rothmans of Pall Mall Canada Limited, North York, Canada

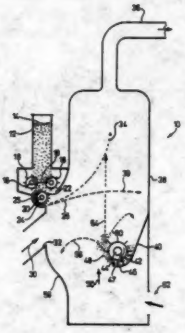
Filed Dec. 14, 1983, Ser. No. 561,296
Claims priority, application United Kingdom, Dec. 16, 1982, 8235883
Int. Cl.[4] A24B 3/06
U.S. Cl. 131—109.1 29 Claims

1. A method of separating a mass of tobacco fragments and heavier tobacco fragments, which comprises:

metering tobacco fragments from a reservoir containing the mass of shredded tobacco material and having open upper and lower ends by rotating a pair of horizontally-spaced

rollers located at the lower end of the reservoir about parallel axes,

opening the metered tobacco fragments to provide a substantial proportion of the tobacco fragments in substantially separated condition by a third roller located below and substantially equidistantly from the axes of the pair of rollers for rotation about an axis parallel to the axes of the pair of rollers, and



exposing said opened tobacco mass to a generally upwardly-flowing gas stream having a velocity sufficient to entrain the lighter tobacco fragments therein but insufficient to entrain the heavier tobacco fragments, whereby said lighter fragments are carried with the gas stream while the heavier fragments are not.

4,627,448

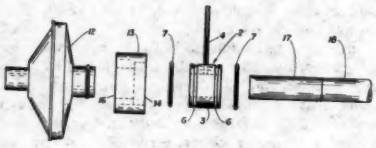
TOBACCO SMOKE ARTICLE HOLDER AND METHOD THEREFOR

Roger D. Kamm, 77 Marion Rd., Watertown, Mass. 02172, and Louis Fine, 601 North Grove, Oak Park, Ill. 60302

Filed Feb. 25, 1985, Ser. No. 705,160

Int. Cl.[4] A24F *13/02, 13/08*

U.S. Cl. 131—187 **14 Claims**



1. A tobacco smoke article holder for use with a tobacco article smoke testing machine capable of simulating tobacco smoke article filter - human lip mucosal relation comprising: a conduit having an inlet and an outlet end; fluid pressure means in fluid communication with the interior of the conduit; a circumferential thin-walled flexible liner sized to circumferentially line the inner wall surface of said conduit with the opposite ends of the liner at the conduit inlet end and outlet end fastened in sealed relation, with sealing means to the inlet end and outlet end of said conduit; said conduit with said liner having a length of approximately 12 mm, said lined conduit having a cross-section when said liner of said conduit is in relaxed state approximate to the cross-section of the tobacco smoke article to be tested; said circumferential flexible liner being inflated by fluid passing through said fluid pressure means into the interface of said circumferential flexible liner and inner wall surface of said conduit to a pressure in the range of 0 Torr to 150 Torr so that said liner will exert a pressure in the range of 0 Torr to 150 Torr on a tobacco smoke article inserted into the inlet end of said lined conduit resulting in simulating tobacco smoke article - human lip mucosal relation; and the sealing means at the outlet end of said lined conduit also constituting a connecting means to sealingly connecting the lined conduit to a coupler means for coupling the lined conduit to the smoke testing machine.

4,627,449

PROCESS FOR AUGMENTING OR ENHANCING AROMA OR TASTE OF SMOKING TOBACCO AND SMOKING TOBACCO ARTICLE USING ALDEHYDE COMPOSITION

Jacob Kiwala, Brooklyn, N.Y.; Braja D. Mookherjee, Holmdel, and Robert W. Trenkle, Point Pleasant, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jul. 12, 1985, Ser. No. 754,122

Int. Cl.[4] A24B *3/12, 15/30*

U.S. Cl. 131—276 **4 Claims**

1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of intimately admixing with the smoking tobacco, an aroma or taste augmenting or enhancing quantity of a composition of matter consisting essentially of:

(a) from about 0.5 up to about 7% by weight of said composition of n-hexanal;

(b) from about 5 up to about 21% by weight of said composition of n-octanal;

(c) from about 30 up to about 80% by weight of said composition of n-nonanal;

(d) from 0 up to about 40% by weight of said composition of n-decanal;

(e) from 0 up to about 7% by weight of said composition of n-tetradecanal;

(f) from about 7 up to about 12% by weight of said composition of n-heptanal;

(g) from 0 up to about 12% by weight of said composition of n-undecanal; and

(h) from 0 up to about 12% by weight of said composition n-dodecanal.

4,627,450

PROCESS FOR FORMING GROUPS OF CIGARETTES

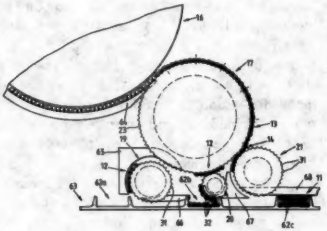
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Division of Ser. No. 379,197, May 17, 1982, Pat. No. 4,592,374. This application Mar. 13, 1985, Ser. No. 711,332

Claims priority, application Fed. Rep. of Germany, May 23, 1981, 3120674

Int. Cl.[4] A24C *5/35*

U.S. Cl. 131—282 **2 Claims**



1. A process for forming multiple layer groups of cigarettes (10), comprising:

(a) supplying cigarettes (10) continuously in a tight row,

(b) removing from the tight row a succession of row seg-

ments of cigarettes (10) of corresponding number in sequence, and

(c) depositing said row segments of corresponding number of cigarettes in multiple row superposed layer contact with each other, with the cigarettes (10) of one row layer laterally offset and in saddle position with respect to the adjacent row layer to thereby form a multi-layer cigarette group (11).

4,627,451

MEANS OF COMB BRISTLES BY OVERALL PLANTING METHOD

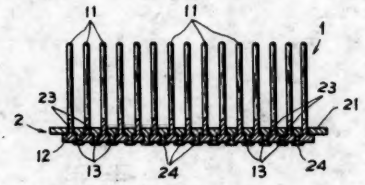
Che-Yuan Chang, P.O. Box 10160, Taipei, Taiwan

Filed Nov. 26, 1984, Ser. No. 674,743

The portion of the term of this patent subsequent to Apr. 9, 2003, has been disclaimed.

Int. Cl.[4] A45D *24/00*

U.S. Cl. 132—11 A 4 Claims



1. An improved means of comb bristles comprising:

a bristle holder which is integratedly formed with a plurality of bristles extending from a bristle base and a plurality of holes on said bristle base, each hole positioned between every two bristles; and

an embedding element which is formed with a plurality of fixing tips each corresponding to each hole on said bristle base, and a plurality of bristle holes corresponding to said bristles,

said embedding element being combined with said bristle holder by inserting all fixing tips into all holes on said bristle base and then heating s d fixing tips to melt as butts to seal all holes on said bristle base and firmly bind said embedding plate with said bristle base to prevent from the retraction of said bristles during combing operation, said bristles being overall electroplated before inserting into embedding plate to have beautiful appearance and prevent from rust.

4,627,452

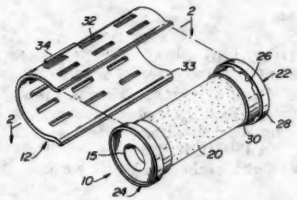
ELECTRICALLY HEATED HAIR ROLLER

Richard Caruso, 7801 Montgomery Ave., Elkins Park, Pa. 19117

Filed Jun. 9, 1983, Ser. No. 502,890

Int. Cl.[4] A45D *2/12*

U.S. Cl. 132—33 R 11 Claims



1. Apparatus comprising a hair curler having a core arranged at one end for temporary contact with an external electrical heater, said core being an electrically conductive metal, a non-metallic end cap connected to each end of the core, a generally C-shaped shield open at both ends, said shield frictionally embracing a portion of said end caps, said shield having its inner surface spaced from said core by said end caps, means defining slots through which steam may enter the space between the shield and core while the core is being heated, and said shield being provided with a handle to facilitate manipulation thereof, said handle projecting generally radially outwardly of the sleeve at a location adjacent its bight.

4,627,453

ARTIFICIAL FINGERNAILS AND METHOD OF APPLICATION

Bonnie J. Isler, 1801 James Town Rd., Apt. 1, Belleville, Ill. 62221

Filed Jun. 15, 1984, Ser. No. 621,244

Int. Cl.[4] A45D *29/00*

U.S. Cl. 132—73 8 Claims

1. A method of forming an artificial nail including the steps of adhering a first layer of organic material over substantially the entire surface of a wearer's natural nail with an inner edge of the first layer spaced from the wearer's cuticle, adhering a second layer of organic material over substantially the entire surface of the first layer with an inner edge of the second layer adjacent the cuticle, applying adhesive over the second layer and then applying hardening solution to harden the nail.

4,627,454

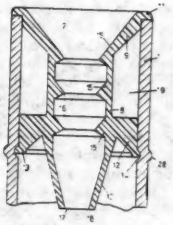
COSMETIC STICK WITH APPLICATOR

Klaus-Peter Dahm, Stettiner Strasse 25A, 3011 Rethen/Leine, Fed. Rep. of Germany

Continuation of Ser. No. 965,657, Dec. 1, 1978, abandoned, which is a continuation of Ser. No. 644,186, Dec. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 539,735, Jan. 9, 1975, abandoned. This application May 27, 1983, Ser. No. 498,956

Int. Cl.[4] A45D *40/26*

U.S. Cl. 132—88.7 18 Claims



1. A one-piece, integrally and simultaneously formed hollow wiper member for use in connection with an applicator assembly which includes a container having an open end and an applicator having an elongated shaft and an application member secured to one end of said shaft which is insertable into said

one end of said container so as to remove a liquid or powdery preparation contained therein, comprising:

a hollow wiper housing having an internal surface defining an internal channel and at least two annular, asymmetrical, resilient, radially-deformable first wiper lips disposed successively in said channel of said wiper housing adjacent to said open end of said container and directed radially-inwardly from said surface of said wiper housing, each of said first wiper lips having a generally triangular cross section and having a radially inwardly and downwardly sloping upper surface and a radially inwardly and upwardly sloping lower surface converging into a wiping edge at an angle of about at least 90°, said upper surface being longer than said lower surface, said edge having a diameter which is less than the diameter of said application shaft;

at least one second wiper lip disposed beneath and spaced apart from said first wiper lips in said housing, said second wiper lip having a smaller diameter than the application member so that when the applicator shaft and the member are withdrawn from said container, said second wiper lip makes wiping contact with the application member to portion the amount of liquid or powder removed from said container, and said first wiper lips become radially deformed and make wiping contact with said applicator shaft so as to completely clean and remove the powder or liquid adhering to the surface of said applicator shaft.

4,627,455

UMBRELLA RIB LINKAGE SYSTEM

Toshio Okuda, Hirakata, Japan, and Tsun-Zong Wu, Taipei, Taiwan, assignors to 'totes', incorporated and Fu Tai Umbrella Works Ltd.

Filed Nov. 27, 1984, Ser. No. 675,209

Claims priority, application Taiwan, Nov. 30, 1983, 7228218; Japan, Dec. 12, 1983, 58-191922[U]

Int. Cl.[4] A45B *19/00, 25/00*

U.S. Cl. 135—25 A **28 Claims**

1. An umbrella comprising

a centerpost having a runner slidable thereon,

a cover connected at its center to said centerpost, and

a topless rib linkage beneath said cover, said linkage having a cover rib to which said cover is connected, said cover rib having a bend therein at an inner end closest to said centerpost, a straight stretcher rib connecting said runner and said cover rib, said stretcher rib being attached to said cover rib at the inner end thereof on one side of said bend, a support rib connecting said stretcher rib and said centerpost, and a control link located beneath said stretcher rib and connecting said support rib and said cover rib, said control link being attached to said cover rib on the other side of said bend and spaced away from said cover rib inner end, said bend of said cover rib being oriented to angle said inner end of said cover rib away from said cover so that the connection of said cover rib and said stretcher rib is displaced away from said cover when said rib linkage is in a full opened position, and said stretcher rib, cover rib, support rib and control link defining a profile opening of generally parallelogram configuration beneath said stretcher rib of when said umbrella is held upright and said rib linkage is between full opened and full closed positions, and defining a profile opening of a generally triangle configuration beneath said stretcher rib when said umbrella is held upright and said rib linkage is in said full opened position, wherein said support rib further comprises a bend between the connections of said stretcher rib and said control link providing a generally coaxial alignment of an outermost segment of the support rib and the control link when said linkage is in said full opened position.

4,627,456

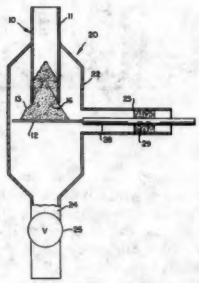
VALVE SYSTEM FOR PARTICULATE SOLID FLOW CONTROL

William E. BeVier; Kenneth C. Kather, both of Kenmore, and Lawrence S. Graczyk, Orchard Park, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 31, 1985, Ser. No. 760,922

Int. Cl.[4] F16K *3/02*

U.S. Cl. 137—1 **12 Claims**



1. A method for controlling the flow of particulate solid material and fluid material enabling reduction in valve wear and in particle abrasion and breakdown comprising: passing particulate solid material and fluid material into an enclosure through an essentially vertically oriented inlet conduit having a downward directed opening; positioning within the enclosure a surface structure beneath and vertically spaced from said inlet conduit opening; piling particulate solid material passing through the inlet opening into the surface structure in a roughly conical pile having an angle of repose sufficient to enable the pile to completely block the inlet opening; opening a fluid flow control valve in an outlet conduit; thereafter removing the surface structure from the defined position beneath the downward directed opening; passing particulate solid material out from the enclosure through said open valve; and closing the valve in the outlet conduit after the flow of particulate solid material through the valve has ceased, whereby pressure contact between particulate solid material and valve surfaces is avoided.

4,627,457

METHOD AND APPARATUS FOR TREATING A PLURALITY OF ZONES OF A PROCESSING LINE

Kenneth J. H. Bird, Beeston; Robert J. Cross, Allestree, and Manjit Singh, Kimberley, all of England, assignors to Diversey Corporation, Mississauga, Canada

Filed Jul. 18, 1985, Ser. No. 756,757

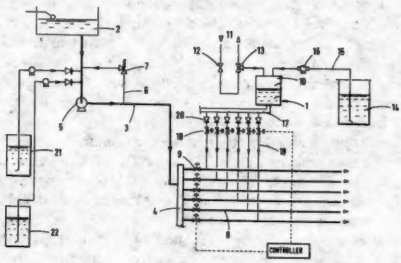
Claims priority, application United Kingdom, Jul. 24, 1984, 8418778

Int. Cl.[4] B65G *45/02*

U.S. Cl. 137—1 **19 Claims**

1. A method of treating a plurality of zones of a processing line with a liquid, the liquid comprising a treatment liquid and

a carrier liquid, wherein the treatment liquid is introduced as discrete slugs, into pipes conveying the carrier liquid to each



zone, and wherein the volume of each slug is selectively variable or wherein each slug may be introduced into the pipes at a selectively variable frequency.

4,627,458

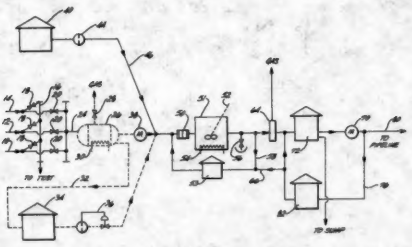
ONE-STEP PROCESS FOR TRANSFORMING A WATER-IN-OIL EMULSION INTO AN OIL-IN-WATER EMULSION

Rama R. S. Prasad, Bakersfield, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 585,435, Mar. 2, 1984, abandoned. This application Nov. 27, 1985, Ser. No. 802,851

Int. Cl.[4] F17D *1//16*

U.S. Cl. 137—13 **17 Claims**



1. A process for the production of an oil-in-water emulsion for pipeline transmission which comprises:

(a) producing a hydrocarbon crude including a water-in-oil emulsion;

(b) adding to said hydrocarbon crude when said crude is at a temperature of from about 100° to about 200° F., an emulsifier system capable of forming and sustaining an oil-in-water emulsion at said temperature and at ambient pipeline transmission temperatures, the amount of emulsifier system added being sufficient to form and sustain an oil-in-water emulsion having a selected water content of from about 15 percent to about 35 percent by weight water and a viscosity sufficiently low for pipeline transmission;

(c) agitating the hydrocarbon crude including a water-in-oil emulsion and the added emulsifier system, to form an oil-in-water emulsion; and

(d) separating any excess water from the formed oil-in-water emulsion.

4,627,459

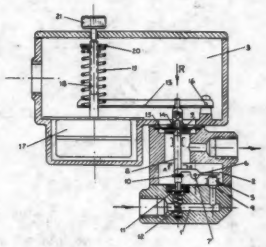
PNEUMATIC PRESSURE TRANSMITTER

Izrail B. Gulko, #305-1121-15 Ave SW., Calgary, Alberta, Canada T2R 0S8

Continuation-in-part of Ser. No. 558,388, Dec. 5, 1983, abandoned. This application Apr. 29, 1985, Ser. No. 728,441

Int. Cl.[4] G05D *16/06*

U.S. Cl. 137—116.5 **2 Claims**

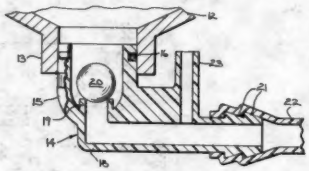


1. A pneumatic pressure transmitter for accurate pressure setting having a pressure regulating means comprising a frame with a supply pressure chamber, a control pressure chamber and a reference pressure chamber, a loading diaphragm which separates the control pressure chamber and the reference pressure chamber, a loading spring for putting a reference force on the the loading diaphragm; an exhaust port in the centre of said diaphragm, means for ventilation of excess pressure from the control pressure chamber; the control pressure chamber contains an inlet port in communication with the supply pressure chamber; an inlet plug means for closing the inlet port; a stem having a shouldermount (10) on its surface, and an exhaust plug at one end for closing the exhaust port; a two arm lever with a pivot fixed at the frame, one arm of said lever is fork shaped and rests by its prongs on the shouldermount, the other arm pushes the inlet plug closing the inlet port; a balance diaphragm separates the supply pressure chamber from the control pressure chamber and creates a balance force proportional to the difference between supply and control pressure, that force is applied to the other end of the stem; an auxilliary spring means for putting an additional force at the stem; said inlet and exhaust ports, stem with the exhaust plug and shouldermount, lever, inlet plug, loading diaphragm, balance diaphragm and auxilliary spring interact in such a way, that force created by the balance diaphragm and the auxilliary spring pushes the stem and, through the shouldermount, pushes the fork shaped arm of the lever, while the other arm of said lever pushes the inlet plug and closes the inlet port; when the reference force is counterbalanced by the pressure in the control pressure chamber, the loading diaphragm with the exhaust port moves onto the exhaust plug and closes the exhaust port; the balance force together with the force of the auxilliary spring is sufficient to keep the both ports closed; whereby a surplus pressure in the control pressure chamber lifts the loading diaphragm with the exhaust port and opens said port, while the fork shaped arm of the lever prevents the stem with the exhaust plug from following the exhaust port; the other arm of the lever pushes the inlet plug and keeps the inlet port closed; lack of pressure in the control pressure chamber moves the loading diaphragm in the opposite direction, and that action closes the exhaust port, pushes the stem, removes or reduces the force from the fork shaped arm of the lever and, consequently, from the inlet plug, whereby the force of supply pressure opens the inlet port.

4,627,460
CONDENSATE DISCHARGE DEVICE FOR COMBUSTION APPARATUS

John P. Eising, Oconomowoc, Wis., assignor to A. D. Smith Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 616,608, Jun. 4, 1984, abandoned. This application Nov. 15, 1985, Ser. No. 798,793
Int. Cl.[4] F16T *1/20*
U.S. Cl. 137—192 6 Claims

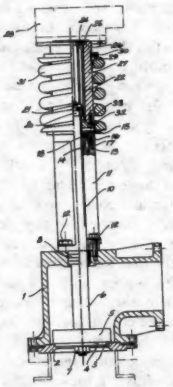


1. A condensate discharge device for a combustion appartus, comprising a housing having an inlet connected to a conduit containing waste gases of combustion and having an opening in the lower end, an outlet tube havihg one end disposed within the opening and defining a seat, a spherical float disposed within the housing and disposed to engage the seat to prevent flow through said outlet tube, condensate generated by cooling of said combustion gases flowing from said conduit into said housing and an accumulation of condensate above the level of said seat causing the float to lift from the seat to permit the discharge of condensate while preventing discharge of gas through said outlet tube, and a vent tube connected to said outlet tube and extending upwardly therefrom, an accumulation of condensate in said outlet tube being discharged through said vent tube to prevent said condensate from backing-up into said conduit.

4,627,461
SELF CLEANING VALVE

Patrick J. Gordon, Cromer, Australia, assignor to K. J. Baillie Pty. Ltd., New South Wales, Australia

Filed Oct. 3, 1985, Ser. No. 783,433
Int. Cl.[4] F16K *29/00, 31/50*
U.S. Cl. 137—243.1 3 Claims

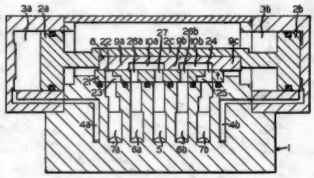


1. A fluid control valve having an actuator, a valve seat, a circular closure member cooperating with said valve seat to control fluid flow through the valve, a spindle turned by said actuator and provided with an externally threaded section and having said closure member at its lower end, a sleeve turned at its upper end by said actuator and rotating said spindle which extends into its lower end, a formation on the upper end of said spindle engaging the interior of said sleeve which is shaped to allow said formation to slide axially in said sleeve without relative rotation occurring therebetween, a housing provided with upper and lower tubular coaxially arranged and spaced casings one of which contains said sleeve and the other of which surrounds said threaded section of said spindle, an internally threaded collar screwed onto said threaded section of said spindle and having a part which engages with the surrounding casing in a way which constrains said collar to move axially but without rotation in the surrounding casing when the spindle is rotated by the sleeve, a flange extending radially outwards from said collar between said two casings with sufficient clearance to allow axial movement of said collar in a direction away from said valve seat, an adjustment nut screwed onto a threaded section of one of the surrounding casings, and a coil spring coaxially surrounding the casing carrying the nut and engaging said nut at one end and said flange at the other end to exert a resilient bias urging said spindle towards said valve seat while yielding resiliently to allow movement of said collar in a direction away from said valve seat.

4,627,462
SELECTABLE FUNCTION VALVE DEVICE

Michael D. Lyons, Lexington, Ky., assignor to American Standard Inc., Lexington, Ky.

Filed Apr. 1, 1983, Ser. No. 481,192
Int. Cl.[4] F15B *13/04*
U.S. Cl. 137—270 14 Claims

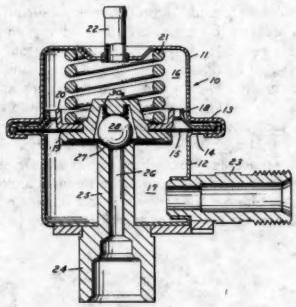


1. A multiposition valve device comprising:
(a) a housing;
(b) operating means for selectively positioning said valve device in selected valve positions;
(c) a dynamic plate having at least one cavity carried by said operating means for axial movement therewith;
(d) a plurality of fluid-carrying passageways in said housing connectable to fluid devices;
(e) a stationary plate mounted in said housing intermediate said passageways and said dynamic plate;
(f) said stationary plate having a plurality of through-bores;
(g) at least one of said through-bores having an enlarged diameter opening on one side of said stationary plate;
(h) said stationary plate being of a generally symmetrical design about the plane perpendicularly intersecting the axis of said through-bore, such that said stationary plate can be mounted in said housing with said enlarged diameter opening adjacent said dynamic plate, and alternatively with said enlarged diameter opening adjacent said passageways in said housing; and
(i) at least portions of said one side of said stationary plate and the opposite side of said stationary plate having surfaces to provide slidable sealing with said dynamic plate.

4,627,463
FUEL PRESSURE REGULATOR

David L. Johnstone, Waterford, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.

Filed Apr. 11, 1985, Ser. No. 721,958
Int. Cl.[4] F16K *31/12*
U.S. Cl. 137—510 3 Claims



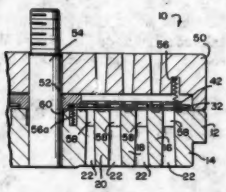
1. A fuel pressure regulator comprising a housing,
a diaphragm dividing the housing into a first chamber and second chamber,
a passage from the exterior of the housing to said first chamber,
an inlet and an outlet associated with the second chamber of the housing,
a frustoconical valve seat associated with the outlet,
a cage mounted on and movable with the diaphragm,
a spring within the first chamber yieldingly urging the cage toward the valve seat,
a cage,
a first plate fixedly mounted on said cage and having an opening therethrough,
a second plate overlying said first plate and having an opening therethrough,
a ball positioned between said cage and said second plate and engaging the opening in said second plate,
said cage having a cavity into which said ball is attached,
said ball being rotatable relative to said second plate,
the opening in said second plate having a diameter less than the diameter of said ball,
the diameter of the opening in said first plate being less than the outer diameter of said second plate,
a light spring interposed between said cage and said ball urging said ball through the opening in said first plate toward said valve seat,
the outer diameter of said second plate being less than the diameter of the portion of the cage which surrounds the periphery of said second plate such that said ball and said second plate can move laterally to accommodate any misalignment between the ball and the valve seat.

4,627,464
UNIDIRECTIONAL, FLUID CONTROL VALVE

Kevin Hartshorn, Plainsboro, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 20, 1985, Ser. No. 811,446
Int. Cl.[4] F16K *15/08*
U.S. Cl. 137—516.13 8 Claims

1. A unidirectional, fluid control valve, comprising:
first means defining a valve seat having a seating surface, and fluid ports formed therein;
second means, coupled to said valve seat, defining a ported, valving element stop having a planar, stop surface; and
third means, movably disposed between said seat and said stop, (a) for engaging said seat and occluding said ports in said seat, and (b) for lift thereof from said seat to expose said ports in said seat, thereby to prohibit, and to permit, fluid flow through said ports in said seat, respectively; wherein
said third means comprises an apertured valving element, and an apertured buffer element;

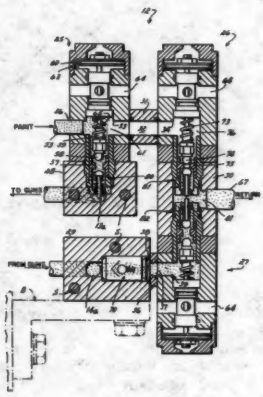


said buffer element is interposed between said valving element and said seat; and
apertures in said buffer element are occluded by said valving element; and further including
means interposed between said seating surface and said stop surface for restricting lift of said buffer element.

4,627,465
COLOR CHANGER

James A. Kolibas, Broadview Heights, and William P. Mueller, Elyria, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Continuation of Ser. No. 680,134, Dec. 10, 1984, abandoned. This application Feb. 13, 1986, Ser. No. 829,444
Int. Cl.[4] F16K *11/00*
U.S. Cl. 137—563 23 Claims



17. A recirculating color changer for selectively controlling introduction of paint from respective supplies of paint of various colors to a paint application and for recirculating paint to a respective paint supply, said color changer comprising:
a plurality of color module means, each for selectively directing paint of one color from a first paint color supply to said application and for returning paint of said one color from said first supply to said first supply when said color is not selected and for returning excess paint of said color to said first supply during painting with said color;
each said module means defining a respective portion of a universal applicator paint supply manifold, means for conveying paint of a selected color to said applicator, and a universal applicator paint return manifold for returning

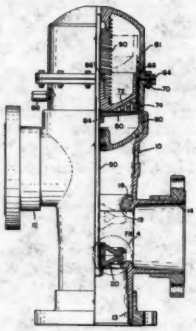
excess paint of a selected color from said applicator to a paint supply for paint of said selected color.

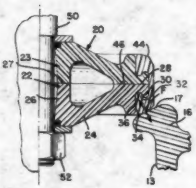
4,627,466

VALVE AND ACTUATOR

Robert G. Stark, Sr., 735 NE. 198th St., Seattle, Wash. 98155; Robert G. Stark, Jr., 5731 SW. Idaho, Portland, Oreg. 97221; Tom Stark, 551 Lakeside Dr., Sedro Wooley, Wash. 98284, and Joseph W. Anderson, 9845 NE. 22nd St., Bellevue, Wash. 98004

Filed Sep. 5, 1985, Ser. No. 773,373
Int. Cl.[4] F16K *11/044, 31/145;* F01B *19/00;* F16J *3/02*
U.S. Cl. 137—625.5 13 Claims





1. A valve having first and second axially aligned ports, each having a valve seat with a contact surface, comprising:

a valve actuating rod adapted to be moved axially past said seats;

means for moving said actuating rod;

a plastic valve disk having a hollow-interior connected to said rod, said valve disk having a circumferential mounting flange;

said mounting flange for said valve disk including on each axially spaced side thereof a radially outer, axially protruding lip and a radially inner, axially protruding ledge, said lip and ledge forming a recess; and

a deformable sealing ring tightly fitted over and secured to the entire periphery of said flange, wherein the mounting flange also mechanically interlocks the sealing ring to the valve disk.

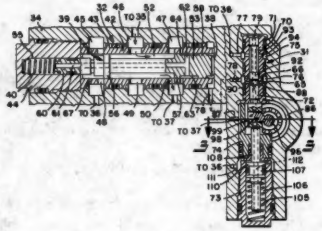
4,627,467

PILOT OPERATED DIRECTIONAL CONTROL VALVE

Eugene J. Martin, Portage, Mich., assignor to Pneumo Corporation, Boston, Mass.

Continuation of Ser. No. 402,741, Jul. 28, 1982, abandoned. This application Oct. 25, 1985, Ser. No. 790,808
Int. Cl.[4] F16K *35/00;* F15B *13/42*
U.S. Cl. 137—625.6 20 Claims

1. A valve mechanism comprising a manually operated pilot valve stage and a hydraulically operated power valve stage, means for communicating fluid to and from said pilot valve stage and said power valve stage by connecting each of said pilot valve stage and said power valve stage to a fluid pressure source and to a fluid return means, said pilot valve stage including a manually movable pilot valve plunger movable between second and first positions for respectively providing a signal pressure to said power valve stage when said pilot valve stage is connected to such fluid pressure source and for venting said signal pressure to said fluid return means, spring means for providing a preload force on said pilot valve plunger urging said pilot valve plunger toward said first position when said pilot valve stage is disconnected from such fluid pressure source, and means for removing said spring means preload force in response to fluid pressure being supplied to said pilot valve stage, said power valve stage including a signal end to which such signal pressure is respectively supplied and vented by said pilot valve stage through passage means in said power valve stage and pilot valve stage during such movements of said pilot valve plunger between said second and first positions as aforesaid, said power valve stage including a power valve



plunger responsive to the pressurizing and venting of said signal end to cause movement of said power valve plunger between two different porting positions for respectively connecting an outlet port in said power valve stage to a pressure port which is directly connected to said fluid pressure source and to a return port which is directly connected to said fluid return means, said power valve plunger having one end exposed to said signal end, whereby when a signal pressure is supplied to said signal end, said signal pressure acting on said one end of said power valve plunger causes said power valve plunger to move to one of said porting positions, and another end of said power valve plunger having a differential area smaller than said one end of said power valve plunger, said differential area on said powre valve plunger being exposed to the fluid pressure source which is directly connected to said pressure port, whereby when said signal end is vented, the fluid pressure source which is directly connected to said pressure port acting on said differential area on said another end of said power valve plunger causes said power valve plunger to move to another of said porting positions.

4,627,468

HYDRAULIC CONTROL VALVE WITH MANUAL OVERRIDE

Raud A. Wilke, Brookfield, and Michael Paik, Waukesha, both of Wis., assignors to Husco International, Inc., Waukesha, Wis.

Filed Aug. 30, 1985, Ser. No. 771,291
Int. Cl.[4] F15B *13/043*
U.S. Cl. 137—625.66 6 Claims

1. A hydraulic control valve of the type including housing means containing an axially movable valve spool and remotely controllable means which provide for actuation of the spool between working and non-working positions, characterized by manually operable means for shifting said spool, comprising:

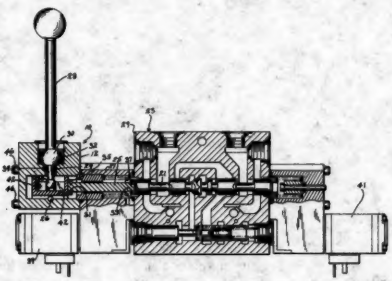
a driver in the housing means, for actuating the spool;

means mounting the driver in the housing means adjacent to

one end portion of the spool to provide for back and forth motion of the driver lengthwise of the spool axis and for motion of the driver crosswise of the spool axis between a neutral position at which the spool is movable relative to the driver and an operative position relative to the spool;

a handle operatively connected to the driver and projecting to the exterior of the housing means to provide for actuation of the driver crosswise of the spool axis as well as lengthwise of said axis;

and means for establishing a driving connection between the spool and driver effective upon handle produced motion of the driver to its operative position, whereby the spool can then be moved axially between working and non-working positions in consequence of handle produced actuation of the driver lengthwise of the spool axis.



4,627,469

COMPOSITE STRUCTURE DUCT

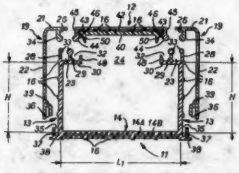
Yvon Buard, Voutre, France, assignor to Legrand, Limoges, France

Filed Dec. 7, 1984, Ser. No. 679,215

Claims priority, application France, Dec. 7, 1983, 83 19563

Int. Cl.[4] H02G *3/04*

U.S. Cl. 138—92 **21 Claims**



1. A duct comprising a body member of plastic material and having a U-shaped cross section and having opposed sidewalls, a base wall and an open end, a cover for closing off said open end of said body member, a first metal casing element for cladding an outer face of one of said sidewalls of said body member, a second metal casing element for cladding an outer face of the other of said sidewalls of said body member, said body member having external engagement means, said casing elements each having complementary engagement means fittingly engageable with said external engagement means for securing said casing elements on said body member.

4,627,470

SEALING DUCTS

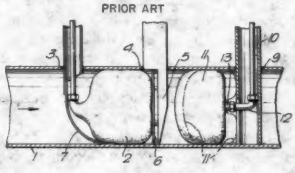
Alec R. Carruthers, Nr. Westbury, England, assignor to ALH Systems Limited, Westbury, England

Filed Jun. 1, 1984, Ser. No. 616,158

Claims priority, application United Kingdom, Jun. 2, 1983, 8315198

Int. Cl.[4] F16L *55/12*

U.S. Cl. 138—93 **7 Claims**



1. Apparatus for sealing a pre-existing duct against fluid flow therein, said apparatus being adapted to be inserted radially into a pre-existing duct through holes provided for this purpose in the wall thereof and comprising:

a primary inflatable bag adapted to be inserted radially into said duct through a first hole of said holes in the wall of said duct, said primary inflatable bag having an upstream end and a downstream end and having an inflation opening at said upstream end thereof for introduction of an inflation fluid into said primary bag;

tube means for inflating said primary bag, said tube means being adapted to be inserted radially into said duct through said first hole of said holes and connected to said primary bag at said upstream end thereof for introduction of an inflation fluid through said inflation opening at said upstream end of said primary bag and into said primary bag to inflate said primary bag into sealing contact with said duct to seal said duct against fluid flow therein;

stop means adapted to be inserted radially into said duct through a second hold of said holes said stop means being located in a primary bag supporting position in a said duct, said position being downstream of said primary bag and located such that said stop means supports said downstream end of said primary bag when said primary bag is inflated into sealing contact with said duct;

a secondary inflatable bag adapted to be inserted radially into said duct through a third hole of said holes in the wall of a said duct downstream of said stop means, said secondary inflatable bag having an upstream end and a downstream end and having an inflation opening at said downstream end thereof for introduction of an inflation fluid into said secondary bag, said secondary bag being adapted to be inserted into said duct with said downstream end having said inflation opening oriented downstream in said duct and with said upstream end oriented upstream in said duct;

further tube means for inflating said secondary bag, said further tube means being adapted to be inserted radially into said duct through said third hole of said holes and adapted to be connected to said secondary bag at said downstream end thereof for introduction of an inflation fluid through said inflation opening and into said secondary bag to inflate said secondary bag into sealing contact with said duct to act as a seal for said duct in the event of a failure of the primary bag;

means for connecting said further tube means to said inflation opening of said secondary bag;

a tubular support member oriented radially in said duct through said third hole of said holes such that said tubular support member extends substantially fully diametrically across said duct, said tubular support member having an upstream face adapted to be positioned substantially coplanar with the downstream end of said secondary bag to

support said secondary bag when said secondary bag is inflated into sealing contact with said duct;

means for securing said tubular support member in fixed position and extending substantially fully diametrically across said duct;

the distance, in the axial direction of said duct, from the location of said further tube means, when said further tube means is inserted radially into said duct and connected to said secondary bag, to said downstream end of said secondary bag when said secondary bag is inflated into sealing contact with said duct, being not substantially greater than a distance, in the axial direction of said duct, from said location of said further tube means to the upstream face of said tubular support member whereby, when said secondary bag is inflated in said duct, an upstream face of said tubular support member is substantially coplanar with the downstream end of said secondary bag; and

the axial length of the area of the secondary bag adapted to contact the duct when said secondary bag is inflated in said duct being at least 0.7 times the diameter of the secondary bag.

4,627,471

SEALING JOINTS AND LEAKS

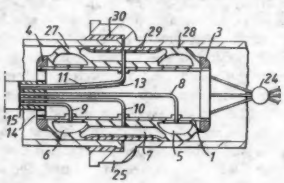
Adrian S. Parkes, Burgess Hill; Gordon J. Corbett, Croydon; Peter S. Clough, Manchester, and Colin N. H. Barker, Stockport, all of England, assignors to British Gas Corporation, United Kingdom

Division of Ser. No. 612,842, May 22, 1984. This application Mar. 25, 1985, Ser. No. 715,453

Claims priority, application United Kingdom, May 23, 1983, 83 14209

Int. Cl.⁴ F16L *55/18*

U.S. Cl. 138—97 **2 Claims**



1. Apparatus for sealing a joint or leak in a fluid-transporting pipeline or main, the apparatus comprising a tubular pig which is movable endwise through the pipeline or main, the pig being hollow to permit fluid to flow therethrough and having an inflatable surface adapted to form with an internal wall of the pipeline or main space which is substantially free of the fluid and which communicates with the joint or leak, an outlet in the surface of the pig, an inlet in the surface of the pig, a reservoir for containing sealant to be supplied to the space to seal the joint or leak, a feed line connecting the reservoir to the outlet in the surface of the pig to feed sealant to the space so formed, a return line connecting the reservoir to the inlet in the surface of the pig to return unused sealant from the space so formed to the reservoir, and means for circulating the sealant between the reservoir and the space by way of the feed and return lines.

4,627,472

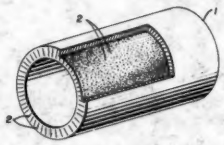
HOSE REINFORCED WITH DISCONTINUOUS FIBERS ORIENTED IN THE RADIAL DIRECTION

Lloyd A. Goettler, and Arthur J. Lambright, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mich.

Continuation of Ser. No. 929,486, Jul. 31, 1978, abandoned, which is a continuation of Ser. No. 792,458, Apr. 29, 1977, abandoned. This application Jan. 18, 1980, Ser. No. 113,143

Int. Cl.⁴ F16L *11/08*

U.S. Cl. 138—174 **1 Claim**



1. A hose having the shape of a hollow cylinder with definite wall thickness and outside diameter and indefinite length, which hose has a smooth surface and is constructed of extrudable polymer reinforced with discontinuous fibers wholly contained therein oriented so that the radial component of fiber orientation exceeds both the circumferential component of orientation and the axial component of orientation whereby the hose will swell, upon exposure to an organic solvent capable of swelling said polymer, in such a manner that the percent increase in its wall thickness is less than the percent increase in its outside diameter as a result of said swelling.

4,627,473

POWER LOOM TEMPLE

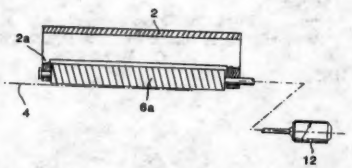
Hubertus Ludwig, Lindau-Bodolz, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Sep. 17, 1984, Ser. No. 651,456

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335208

Int. Cl.⁴ D03J *1/22*

U.S. Cl. 139—294 **4 Claims**



1. In a power loom, a pair of temples maintaining the width of a fabric having a pair of edges extending in a lengthwise direction said temples each having a substantially cylindrical rotary retaining member engaging said edge over a predetermined gripping angle and exerting a force in a direction perpendicular to said lengthwise direction, said temples each further having a cover covering said gripping angle and having a respective first and second end facing said fabric, the improvement comprising

a first and second threaded rod respectively arranged at said first and second end, said rods extending in a direction substantially parallel to said retaining member and making contact with said fabric; and

wherein said fabric is transported in said lengthwise direction at a predetermined transport speed relative to said rods so that said rods stretch said fabric in the direction of said width.

4,627,474

YARN STORING, FEEDING AND MEASURING DEVICE

Lars H. G. Tholander, Huskvarna, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

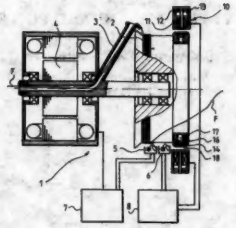
PCT No. PCT/EP83/00254, § 371 Date May 17, 1984, § 102(e) Date May 17, 1984, PCT Pub. No. WO84/01394, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 30, 1983, Ser. No. 614,774

Claims priority, application Sweden, Sep. 3, 1982, 8205598; Dec. 10, 1982, 8207096; Sep. 13, 1983, 8304891; Sep. 20, 1983, 8305040; PCT Int'l Appl., Sep. 30, 1983, PCT/EP83/00254

Int. Cl.[4] D03D *47/36*; B65H *51/20*

U.S. Cl. 139—452 27 Claims



1. In a yarn storing, feeding and measuring device for jet looms, having a stationary storage drum onto which an intermediate yarn store is wound by a winding-on device and from which the yarn is withdrawn spiralling around a withdrawal end of said storage drum, yarn sensing means arranged such that the yarn periodically passes its detection area during withdrawal from the drum, said yarn sensing means producing a pulse signal each time the yarn passes the detection area of said yarn sensing means, a plurality of independently actuable yarn stopping devices arranged at spaced angular intervals around said storage drum, said yarn stopping devices including yarn stopping elements and actuator means for moving said stopping elements into and out of the path of the yarn being withdrawn, and an actuator control device having means for selecting a desired yarn length to be withdrawn, said control device being responsive to said pulse signals in such a way that an actuating signal is transmitted to a selected yarn stopping device whose angular position corresponds to the angular position of the yarn when the desired yarn length has been withdrawn, the improvement comprising wherein said yarn sensing means includes at least one yarn sensor, the number thereof being less than and independent from the number of said yarn stopping devices, and wherein said control device includes storing means for storing information regarding the yarn stopping device actuated at the end of a previous yarn withdrawal cycle and calculating means for selecting one said yarn stopping device which is to be actuated next on the basis of input information representing said desired yarn length and on the basis of said stored information.

16. Method for controlling a loom having a yarn storing, feeding and measuring device which includes a storage drum on which a yarn is wound, a plurality of stopping devices arranged at spaced angular locations about said drum, and a yarn sensor which generates a signal each time the yarn passes its detection area during withdrawal from said drum, comprising the steps of:

calculating an actuation time on the basis of a desired yarn length, said actuation time defining the period of time between deactuation of one of said stopping devices which was actuated at the end of the immediately preceding withdrawal cycle and actuation of a selected one of said stopping devices which is to be actuated next,

measuring the period of time which has elapsed since deactuating said previously actuated stopping device,

correcting said measured period of time on the basis of the signal generated by said yarn sensor, and

actuating said selected stopping device as soon as said corrected period of time corresponds to said calculated actuation time.

4,627,475

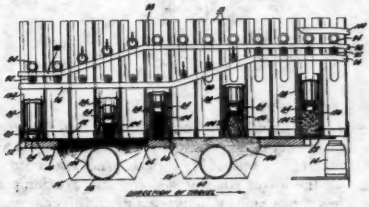
PRODUCT-DISPENSING APPARATUS

Wolf A. von Lersner, Cherry Hill, N.J., assignor to Campbell Soup Company, Camden, N.J.

Filed Aug. 22, 1985, Ser. No. 768,352

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—107 5 Claims



1. Dispensing apparatus for taking a plurality of different component products from respective sources of said component products and for dispensing them as a composite product which is substantially homogeneous with respect to the distribution of said component products within it, comprising:

(a) a cylinder chamber and a plurality of concentric pistons therein, each independently reciprocable in said chamber along the axis thereof;

(b) a plurality of sources of a corresponding number of component products;

(c) motive means for moving one end of said cylinder chamber sequentially into communication with said plurality of sources;

(d) means for retracting said pistons into said cylinder sequentially and in synchronization with said moving of said end of said chamber, whereby each of said component products flows into said chamber in a predetermined amount;

(e) a product dispensing station, and means for moving said one end of said chamber to said product dispensing station, while said pistons remain retracted, thereby to carry said component products to said product dispensing station; and

(f) discharge means for moving all of said pistons outwardly while said chamber is at said dispensing station, to discharge all of said component products together as a composite product.

4,627,476

TONER REFILL CONTAINER

Gerhard Wilcke, Berlin, Fed. Rep. of Germany, assignor to Berolina International Marketing Strategie GmbH, Berlin, Fed. Rep. of Germany

PCT No. PCT/DE83/00216, § 371 Date Aug. 10, 1984, § 102(e) Date Aug. 10, 1984

PCT Filed Dec. 21, 1983, Ser. No. 642,677

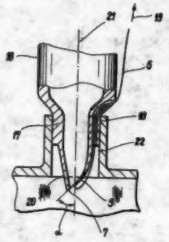
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247965

Int. Cl.[4] B65D *47/10*; G03G *15/08*

U.S. Cl. 141—364 1 Claim

1. A toner refill container for a copying or printing device which has a toner reservoir including a filler neck defining an inlet into said reservoir, said toner refill container comprising a nozzle for insertion into said inlet port and a coupling ring, said coupling ring adapted to be secured to said filler neck when said nozzle is inserted into said inlet port, said coupling ring at

least partially surrounding said nozzle, said coupling ring defining a guide channel therein, a foil sealing an opening of said nozzle, a cord attached to said foil, said cord being received in said guide channel in said coupling ring and extending from said filler neck so that said foil may be removed from said



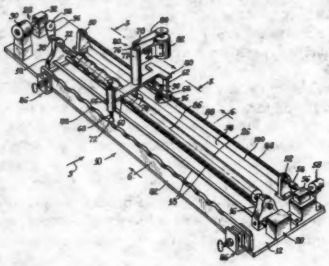
nozzle by pulling said cord from outside of said filler neck, a nozzle edge bordering the opening of the nozzle having a slope to the longitudinal axis of the nozzle, and said cord being attached to the lower edge of said foil and extending thereacross when the container is inverted in said filler neck.

4,627,477

LATHE, DUPLICATING

Mahlon Wise, 1709 S. Pulaski, South Bend, Ind. 46613

Filed Nov. 5, 1984, Ser. No. 668,333
Int. Cl.[4] B23B *3/28*; B23Q *35/10*
U.S. Cl. 142—7 **5 Claims**



1. A woodworking duplicating lathe comprising,

a base,

a headstock and a tailstock on the base operable for supporting a workpiece for rotation on a longitudinal axis located generally centrally, transversely, of the base,

a variable speed motor operatively connected to said headstock for rotating the workpiece,

a rotatable threaded rod at one side of the base and parallel with said longitudinal axis,

a variable speed motor operatively connected to said threaded rod for rotating the threaded rod,

a template mounted on the base on the side thereof opposite the threaded rod and extending essentially parallel with said longitudinal axis,

a carriage extending transversely of the base above the workpiece, mounted at one end on the threaded rod and movable by the threaded rod in the direction of said longitudinal axis of the workpiece, and swingable on the threaded rod about the axis of the threaded rod, and having a template follower on its other end,

a rotatable cutter bit in the carriage at a generally central position thereof,

a variable speed motor on said carriage for rotating the cutter bit,

the carriage being swingable between a lower operating position in which the template follower engages the template and the cutter bit engages the workpiece, and an upper inactive position in which the workpiece is exposed to access,

means supporting the threaded rod between the ends of the latter, and movable therealong in response to rotation of the threaded rod, and

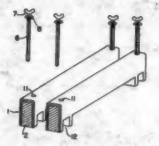
rail means on the bed engageable by said supporting means, and providing bearing support for the supporting means.

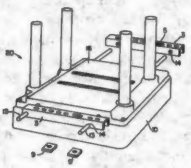
4,627,478

ATTACHMENT FOR A STANDARD POWER PLANER TABLE

John E. Gamble, 10 Annette Ave., Smithtown, L.I., N.Y. 11788

Filed Jan. 31, 1985, Ser. No. 697,075
Int. Cl.[4] B25H *1/00*
U.S. Cl. 144—287 **1 Claim**





1. In a power planer having a planer table to support board lumber having two pair of parallel extending handles in a plane parallel to and below the upper surface of said table, the improvement comprising a pair of parallel extending rails straddling said handles on opposite sites of said planer table, each of said rails having an upper surface with a plurality of spaced openings therethrough, a pair of parallel extending guides mounted at the ends thereof on said rails to span the upper surface of said planer table, each of said guides being notched at each end to fit over and accommodate a rail passing through each notch, a threaded member for each end of said guide to pass through each guide and engage a threaded nut plate under a spaced opening in each rail, and a wing nut for each threaded member to lock each said guide to said rails, thereby securing said guides in place on said planer table, said guides having sufficient height and being properly spaced by the selection of spaced openings in said rails to support a board lumber upright with an edge exposed to permit planing thereof.

4,627,479

TIRE CONSTRUCTION UTILIZING LOW-TWIST BODY PLY YARN WITH HIGH TURN-UP ENDS

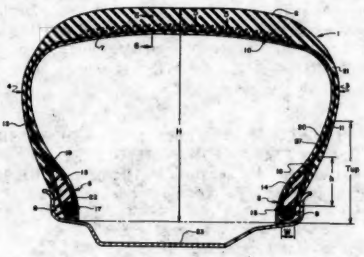
Louis W. Shurman, Canton, and Thomas W. Bell, Mogadore, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 27, 1984, Ser. No. 675,260
Int. Cl.[4] B60C *15/06*
U.S. Cl. 152—541 **9 Claims**

1. An improved pneumatic tire of the type having a tread

portion, a pair of side wall portions, a pair of bead portions located below the side wall portions which include an annular bead core and a generally triangular-shaped bead filler, and a body ply structure extending circumferentially about the tire and being turned-up around the bead portions from the inside to the outside and terminating in a pair of turn-up end portions adjacent the bead filler, said improvement being characterized by:

(a) the body ply being formed of a low twist yarn having between 2 and 5 turns-per-inch;



(b) the turn-up end portions extending along the side wall portions a distance of between 35% and 65% of the tire section height;

(c) the bead filler consisting of a high hardness rubber having a Shore A hardness of between 75 and 98, a height of between 20% and 50% of the tire section height, and a maximum base width of between 5% and 25% of the bead filler height; and

(d) said side wall portions between the tread portion and bead portion being free of any additional textile or metal reinforcement except that provided by the body ply structure.

4,627,480

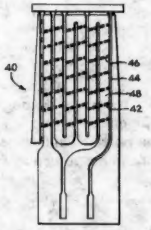
ANGLED TURBULENCE PROMOTER

Ching-Pang Lee, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 549,219, Nov. 7, 1983, Pat. No. 4,514,144, which is a continuation-in-part of Ser. No. 506,156, Jun. 20, 1983, abandoned. This application Jan. 29, 1985, Ser. No. 696,623

Int. Cl.[4] B22C *9/10*

U.S. Cl. 164—369 **4 Claims**



1. A ceramic core for use in the casting of a hollow turbine blade comprising at least one passage core portion with first and second opposite surfaces, wherein:

a plurality of first grooves are disposed on said first surface at a first angle with respect to the center line of said first surface; and

a plurality of second grooves are disposed on said second surface at a second angle with respect to the center line of said second surface; said first angle being less than 90° and said second angle being greater than 90°.

4,627,481

REFRACTORY CONDUIT ASSEMBLY FOR SUPPLYING MOLTEN STEEL FROM A DISCHARGE VESSEL TO AN INGOT MOLD

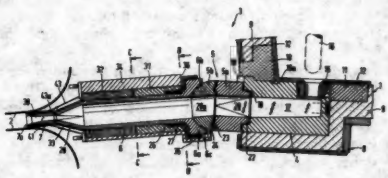
Laurenz Keisers, Krefeld; Gerd Artz, Ratingen; Dieter Figge, Essen; Clemens Philipp, Meerbusch, and Hans Siemer, Essen, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 31, 1984, Ser. No. 636,241

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1983, 3328586

Int. Cl.[4] B22D *11/10*

U.S. Cl. 164—440 **46 Claims**



1. A refractory conduit assembly, particularly for the transfer of molten steel from a discharge vessel to an ingot mold of a horizontal continuous casting plant having revolving ingot mold walls in the form of endless belts, said assembly comprising:

a replaceable spout member adapted to be removably connected at a predetermined location to a vessel, said spout member having therethrough a discharge channel of rectangular cross section to receive from the interior of the vessel a flow of molten steel and to lead such flow to the exterior of the vessel, said spout member comprising a prefabricated wedge-shaped element adapted to be built into a lining of the vessel and to be accessible from the outer surface thereof, and means for locating said spout member in said predetermined location in the vessel lining;

shut off means for interrupting the flow to said discharge channel, said shut off means including an outlet member embedded in said spout member and having therethrough a discharge opening joining said discharge channel and adapted to be blocked by a stopper;

a casting tube located at a position outside of the vessel, said casting tube having therethrough a flow passage with inlet and outlet ends;

a coupling means for connecting said inlet said end of said flow passage to said discharge channel, such that the flow of molten steel passes through said casting tube, said coupling means located at a position outside of the vessel;

said outlet end of said flow passage having a cross-sectional configuration different from that of said inlet end thereof and adapted to that of an ingot mold to which the flow of molten steel is to be supplied; and

a nozzle having an inlet end connected to said casting tube and an outlet end having thereat means for sealingly contacting walls of the ingot mold, said nozzle having therethrough a flow channel to pass the flow of molten steel from said casting tube to the ingot mold.

4,627,482

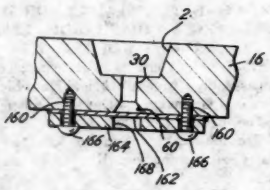
ARC-FURNACE FOR THE PRODUCTION OF SMALL INVESTMENT CASTINGS OF REACTIVE OR REFRACTORY METALS SUCH AS TITANIUM

Richard M. Waterstrat, Gaithersburg, Md., assignor to American Dental Association Health Foundation, Washington, D.C.

Continuation of Ser. No. 258,673, Apr. 29, 1981, abandoned. This application Feb. 5, 1985, Ser. No. 698,268

Int. Cl.[4] B22D *23/00*

U.S. Cl. 164—514 **3 Claims**



1. An improved arc furnace and investment casting apparatus capable of melting and casting small quantities of reactive or refractory metals such as titanium comprising, in combination:

(a) an arc furnace, vacuum sealed melting chamber for maintaining an inert gas atmosphere including a readily removable internally cooled inert material bottom enclosure wall as an anode, a metal crucible integrally defined in the internally cooled inert bottom wall, said crucible positioned substantially at the middle of the bottom wall;

(b) a non-consumable cathode projecting into the melting chamber over the metal crucible;

(c) means for providing power to the cathode and the anode to melt the crucible contents;

(d) a passage through the bottom wall from the metal crucible;

(e) a vacuum sealed casting chamber, for maintaining a vacuum, suspended from the bottom wall beneath the crucible passage, said casting chamber including a removable bottom cover for access to the interior of the casting chamber;

(f) a removable hot mold assemby within the casting chamber including an opening to the mold position below the crucible passage;

(g) a meltable vacuum sealing foil valve in the casting chamber at the bottom of the crucible passage;

(h) means for evacuating each chamber; and

(i) means for purging each chamber with inert gas.

4,627,483

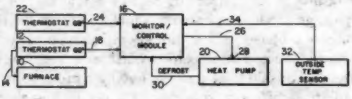
HEAT PUMP CONTROL SYSTEM

John H. Harshbarger, III, and John H. Harshbarger, Jr., both of Xenia, Ohio, assignors to Visual Information Institute, Inc., Xenia, Ohio

Filed Jan. 9, 1984, Ser. No. 569,218

Int. Cl.[4] F25B *13/00, 29/00*

U.S. Cl. 165—2 **39 Claims**



32. A method of controlling a heating system having a supplemental heat source and a heat pump for supplying heat to an interior space, wherein the heating system includes a thermostat mechanism that activates the heat pump and supplemental heat source in response to ambient temperatures in the interior space sensed by the thermostat, said method comprising: sensing when the supplemental heat source is operating during a cyclically recurring time interval, and disabling the heat pump when the supplemental heat source is operating for a predetermined portion of the cyclically recurring time interval.

39. A method of controlling a heating system having a supplemental heat source and a heat pump for supplying heat to an interior space, wherein the heating system includes a thermostat mechanism that activates the heat pump and supplemental heat source in response to ambient temperature sensed by the thermostat, said method comprising: sensing when the supplemental heat source is operating simultaneously with the heat pump during a cyclically recurring time interval, and disabling the heat pump when simultaneous heat pump and supplemental heat source operation occurs for a predetermined portion of the cyclically recurring time interval.

4,627,484

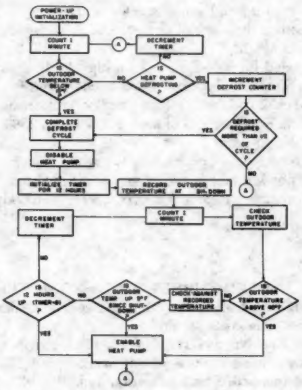
HEAT PUMP CONTROL SYSTEM WITH DEFROST CYCLE MONITORING

John H. Harshbarger, Jr., and John H. Harshbarger, III, both of Xenia, Ohio, assignors to Visual Information Institute, Inc., Xenia, Ohio

Filed Jan. 9, 1984, Ser. No. 569,258

Int. Cl.[4] F25B *13/00, 29/00*

U.S. Cl. 165—2 **28 Claims**


POWER-UP INITIALIZATION
COUNT 1 MINUTE
DECREMENT TIMER
IS OUTDOOR TEMPERATURE BELOW 0° F
IS HEAT PUMP DEFROSTING
INCREMENT DEFROST COUNTER
COMPLETE DEFROST CYCLE
DEFROST REQUIRED MORE THAN 1/2 OF CYCLE
DISABLE HEAT PUMP
INITIALIZE TIMER FOR 12 HOURS
RECORD OUTDOOR TEMPERATURE AT 9:00 AM
DECREMENT TIMER
COUNT 1 MINUTE
CHECK OUTDOOR TEMPERATURE
IS 12 HOURS UP (TIMER=0)
IS OUTDOOR TEMP UP 5°F SINCE 9:00 AM
CHECK AGAINST RECORDED TEMPERATURE
IS OUTDOOR TEMPERATURE ABOVE 40°F
ENABLE HEAT PUMP

23. A method of controlling a heating system having a supplemental heat source and a heat pump for supplying heat to an interior space, wherein the heating system includes a thermostat mechanism that activates the heat pump and supplemental heat source in response to ambient temperature sensed by the thermostat, said method comprising: sensing when the heat pump is in a defrost cycle, calculating a value representing the portion of its cyclically recurring heating cycle during which the heat pump is in its defrost cycle, and disabling the heat pump when the defrost portion value exceeds a predetermined value representative of a given percentage of a given cyclically recurring heating cycle.

4,627,485

ROTARY REGENERATIVE HEAT EXCHANGER FOR HIGH TEMPERATURE APPLICATIONS

Henry H. Osborn, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Oct. 23, 1984, Ser. No. 664,124

Int. Cl.[4] F28D *19/04*

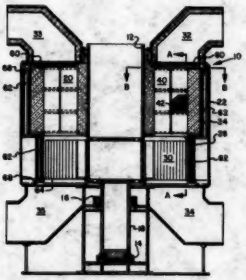
U.S. Cl. 165—8 **2 Claims**

1. A rotary regenerative heat exchanger comprising:

a. A vertical rotor post adapted for rotation about a vertical axis;

b. a lower rotor mounted concentrically about and supported from a lower region of said vertical rotor post, said lower rotor adapted to house a mass of metallic heat absorbent element;

c. an upper rotor mounted concentrically about and supported from an upper region of sAid vertical rotor post, said upper rotor disposed axially above said lower rotor, said upper rotor adapted to house a mass of ceramic heat absorbent element comprised of a plurality of substantially trapezoidal shaped ceramic blosks disposed in at least two layers about said rotor post, each of said ceramic blocks having a plurality of axially aligned flow channels extending therethrough and having a pair of side plates disposed along opposite sides thereof adapted to interlock with a neighboring block in an adjacent layer of said upper rotor;



d. housing means surrounding the upper and lower rotors add including inlet and outlet openings at each end thereof, said housing means defining a first flow passage for passing heating fluid therethough from an inlet at the upper end thereof to an outlet at the lower end thereof and a second flow passage for passing a fluid to be heated therethrough from an inlet at the lower end thereof to an outlet at the upper end thereof, whereby heat will be transferred from the heating fluid to said ceramic and metallic heat absorbent element as the upper and lower rotors rotate through the first flow passage and thence from said ceramic and metallic heat absorbent element to the fluid to be heated as the upper and lower rotors rotate through the second flow passage; and

e. bearing means disposed at the lower end of said rotor post for supporting said rotor post for rotation about its vertical axis and for precluding lateral movement thereof.

4,627,486

CORRECTION FOR TUBE SHEET MISALIGNMENT IN HEAT EXCHANGERS HAVING TUBE CLEANING ARRANGEMENTS THEREIN

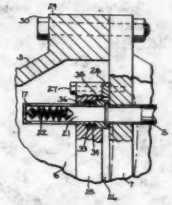
Walter J. Baron, Mequon, Wis., assignor to Water Services of America, Inc., Milwaukee, Wis.

Filed May 28, 1985, Ser. No. 738,430
Int. Cl.[4] F28G *1/12*
U.S. Cl. 165—81 **9 Claims**

1. In combination in a heat exchanger having a hosing (2) with end head elements (3, 4), and having a plurality of longitudinally extending fluid flow tubes (5) disposed within said housing, and having tube sheet elements (6, 7) disposed within said housing and with said tube sheet elements having openings in communication with the ends of said tubes, and further having longitudinally extending basket elements (17) positioned for receiving shuttling tube cleaning devices (22) from said tubes:

(a) a retaining late (25) disposed longitudinally outwardly of and generally parallel to a said tube sheet element (7) and with said basket elements (17) extending through said retaining plate (25) and being mounted for free sliding movement relative thereto in operative position,

(b) and longitudinally compressible means (36, 45–48) disposed between said retaining plate (25) and at least one of



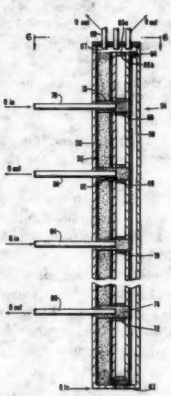
said elements (17, 3, 7) to compensate for misalignment of a said tube sheet element (7) relative to the heat exchanger housing by individually positioning said basket elements (17) in proper sealing relationship with said tube sheet elements (6, 7).

4,627,487

SEPARATE LIQUID FLOW HEAT PIPE SYSTEM

Algerd Basiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 19, 1983, Ser. No. 562,916
Int. Cl.[4] F28D *15/00*
U.S. Cl. 165—104.26 **6 Claims**



1. A heat pipe system comprising:

an elongated heat pipe vapor tube extending in the direction of desired heat transfer, said vapor tube being at least partially lined with a heat pipe liquid wicking material;

a liquid return tube, said return tube being subcooled and substantially without heat pipe liquid wicking material therein;

a first connector between said liquid return tube and said vapor tube adjacent the first end thereof;

a second connector between said liquid return tube and said vapor tube adjacent the second end thereof;

at least one connector between said liquid return tube and said vapor tube between said first and second ends thereof;

heat pipe liquid wicking material filling all of said connectors so as to pass liquid to and from said liquid return tube so that said tubes are connected only through said wicking material; and

a thermal connection connected to said wicking material in

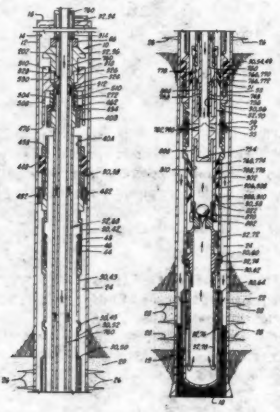
said intermediate connector so that heat exchange takes place within said system intermediate the ends thereof.

4,627,488

ISOLATION GRAVEL PACKER

David D. Szarka, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 20, 1985, Ser. No. 703,630
Int. Cl.[4] E21B *43/04*
U.S. Cl. 166—51 19 Claims



1. A well treatment apparatus comprising:

a housing means;

a stinger receptacle disposed in said housing means, said stinger receptacle including:

an open upper end; and

an inner cylindrical seal bore for sealingly receiving a concentric inner tubing string means for delivering a treatment fluid;

treatment fluid passage means disposed laterally through said housing means for communicating an interior of said stinger receptacle at an elevation below said seal bore with a well zone to be treated;

first and second external seal means, disposed on an exterior of said housing means above and below said treatment fluid passage means, respectively, for sealing between said housing means and a liner bore; and

bypass means, disposed in said housing means, for bypassing well fluid around said first and second external seal means as said apparatus is moved longitudinally within a well.

17. A method of treating a well, said method comprising the steps of:

(a) making up on a lower end of an outer tubing string a tool string including a well treatment apparatus, said well treatment apparatus including a stinger receptacle, a treatment fluid passage means for communicating said stinger receptacle with a well zone to be treated, and a return fluid passage means isolated from said treatment fluid passage means and communicated with an inner bore of said outer tubing string;

(b) lowering said outer tubing string into said well until said well treatment apparatus is appropriately located for treatment of said well zone;

(c) lowering a concentric inner tubing string into said outer tubing string;

(d) stabbing a lower stinger of said concentric inner tubing string into said stinger receptacle;

(e) flowing well treatment fluid from a surface location down through said concentric inner tubing string, then through said treatment fluid passage means to said well zone; and

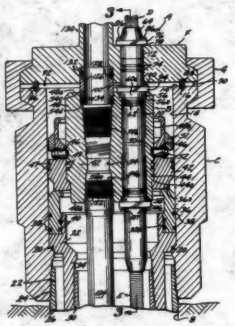
(f) during step (e), flowing a return fluid from said well zone upward through said return fluid passage means of said well treatment apparatus, then up through an annulus between said outer tubing string and said concentric inner tubing string to said surface location.

4,627,489

TOP ENTRY ELECTRICAL TRANSMISSION SAFETY ASSEMBLY FOR SUBMERSIBLE PUMPING

Lehman T. Reed, Bakersfield, Calif., assignor to Midway Fishing Tool Co., Long Beach, Calif.

Filed Nov. 13, 1984, Ser. No. 671,114
Int. Cl.[4] E21B *33/03*
U.S. Cl. 166—65.1 8 Claims



1. In a well head that removably supports a tubing hanger having upper and lower end surfaces in the interior thereof and from which tubing hanger a tubing string depends downwardly in a bore hole to an electrically operated submersible pump that has an electric power receiving cable extending upwardly therefrom in said bore hole to terminate in a first end at a position adjacent said lower end surface of said tubing hanger; a bonnet removably mounted on said well head; a source of electric power; an electric power supply cable that has first and second ends, said first end removably connected to said source of electric power, the combination with said well head of a top entry electrical transmission safety assembly of multiple part structure that is mounted in first and second aligned vertical bores in said tubing hanger and bonnet for supplying electric power to said electric power receiving cable from said electric power supply cable and that may have the portion thereof that extends through said second bore separated from the balance thereof for inspection and maintenance without removing said tubing hanger from said well head but only after said electric power supply cable has been disconnected from said source of electric power and said bonnet separated from said well head to prevent the possibility of sparking and arcing between the portions of said electrical transmission safety assembly in a potentially hazardous zone containing hydrocarbon fumes, said top entry electrical transmission safety assembly including:

a. an elongate electric power receiving element secured to said first end of said power receiving cable that extends upwardly in said first bore to terminate in an upper end and a plurality of transversely spaced, metallic, elongate engageable electrical conducting means on said upper end;

b. first means for securing said electric power receiving element in said tubing hanger to dispose said upper end in a predetermined intermediate position in said first bore between said upper and lower end surfaces of said tubing hanger;

c. an elongate electric power supply element secured to said second end of said electric power supply cable that is removably mounted in said first bore, said electric power supply element including a lower end that has a plurality of elongate, electrical conducting metallic engaging means projecting therefrom that slidably engage said engageable means, said electric power supply element of sufficient length as to project upwardly through said second bore to a position above said bonnet when the latter is mounted on said well head after said electric power supply cable has been threaded through said second bore;

d. second means for removably securing said electric power supply element to said tubing hanger when said second means is in a first position, with said second means incapable of being moved to a second position to permit said electric power supply element to be removed from said tubing hanger when said bonnet is mounted on said well head; and

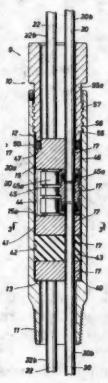
e. third means for removably securing said bonnet to said well head, with said electric power receiving cable receiving electric power when said first end of said electric power supply cable is connected to said source of electric power, with said electric power supply element incapable of being inadvertently separated from said electric power receiving element to cause sparking in a potentially hazardous zone containing hydrocarbon fumes due to said separation capable of being carried out until after said third means has been released from engagement with said bonnet and well head, said first end of said electric power supply cable has been disconnected from said source of electric power, said bonnet separated from said well head, said electric power supply cable drawn through said second bore to separate it from said bonnet, and said second means moved to said second position to permit said electric power supply element to be withdrawn from said first bore and uncoupled from said electric power receiving element.

4,627,490

WELL BORE BARRIER PENETRATOR ARRANGEMENT AND METHOD FOR MULTIPLE CONDUCTOR PUMP POWER CABLE

Boyd B. Moore, 427 Mignon, Houston, Tex. 77024

Filed Jan. 15, 1985, Ser. No. 691,558
Int. Cl.[4] E21B *33/10, 17/043*
U.S. Cl. 166—65.1 **15 Claims**



1. In a wellhead apparatus including a wellhead, the combination of:

hanger means supported on the wellhead;

means in said hanger for supporting a production tubing with an electric pump thereon in the well;

said hanger and wellhead having an opening for multiple conductor power cable to extend to the pump in the well;

housing means for connecting with the opening in the wellhead;

support means in said housing having a plurality of openings for receiving in each opening an individual conductor of the multiple conductor power cable;

said support means including:

engaging means in said housing means for engaging the individual conductors to restrain them against longitudinal movement relative to said housing means;

seal means in said housing for sealingly engaging with the individual conductors; and

positioning means movable relative to said housing means to secure said engaging means against longitudinal movement relative to said housing means and to compress said seal means into sealing engagement with each of the multiple conductors.

4,627,491

WELL PACKER

Gary D. Zunkel, Chickasha, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1985, Ser. No. 757,109
Int. Cl.[4] E21B *33/28*
U.S. Cl. 166—126 **8 Claims**

1. A pack-off device for use in a wellbore, comprising:

a tubular mandrel;

an upper slip assembly slidably disposed on said mandrel;

biasing means acting in a downward direction on said upper slip assembly;

bypass seal means disposed about the exterior of said mandrel on a raised annular shoulder below said upper slip assembly;

ratchet teeth on said mandrel below said bypass seal means;

at least one J-slot lug radially extending from said mandrel below said ratchet teeth; and

a housing assembly disposed about said mandrel in slidable relationship thereto, said housing assembly including;

an upper slip wedge collar;

an upper bypass case secured to said upper slip wedge collar;

a packer saddle extending upwardly inside said upper bypass case in telescoping longitudinally slidable, non-rotatable relationship thereto;

packer element means disposed on said packer saddle;

a lower bypass case secured to said packer saddle;

a lower slip wedge collar secured to said lower bypass case and defining a ratchet dog annulus therewith and with said mandrel;

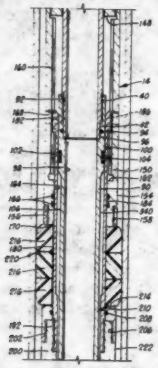
a plurality of inwardly-biased ratchet dogs disposed in said ratchet dog annulus and having teeth on their radially inward surfaces adapted to mate with said mandrel ratchet teeth;

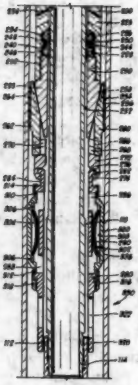
a plurality of circumferentially disposed lower slips slidably secured to said lower slip wedge collar;

a drag block assembly secured to said plurality of slips, said drag block assembly including a plurality of outwardly biased drag blocks thereon and at least one J-slot therein adapted to cooperate with said at least one J-slot lug extending from said mandrel; and

a closeable bypass passage between said housing assembly and said mandrel extending between upper bypass ports in said upper bypass case and lower bypass ports in said lower bypass case through an annular channel defined between said mandrel below said bypass seal means and the interior of said packer saddle, said bypass passage

being closeable through longitudinal movement of said mandrel with respect to said packer saddle, whereby said





bypass seal means carried on said mandrel sealingly engages the interior of said packer saddle.

4,627,492

WELL TOOL HAVING LATCHING MECHANISM AND METHOD OF UTILIZING THE SAME

Scott T. MacLaughlin, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 25, 1985, Ser. No. 780,070
Int. Cl.[4] E21B *34/12, 43/12*
U.S. Cl. 166—250 **13 Claims**

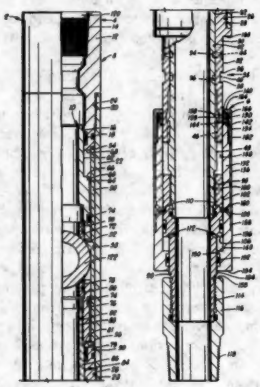
1. A tester tool for controlling fluid flow through a pipe string disposed in a well comprising:

a first valve housing portion having a first engagement shoulder defined therein;

a second valve housing portion having a second engagement shoulder defined therein, said second valve housing portion slidably connected with said first valve housing portion;

a valve member movably retained within said first and second housing portions; and

latch means, slidably disposed adjacent said first and second housing portions, for moving, in response to an applied pressure, between an unlatched position, wherein said first and second housing portions can move relative to each other, and a latched position, wherein said first and second housing portions are latched to prevent relative movement, said latch means having third and fourth engagement shoulders defined therein for engaging said first and second engagement shoulders when said latch means is moved by the applied pressure to said latched position, wherein said latch means includes:



a slide member having a surface defining said fourth engagement shoulder;

a locking dog having a surface defining said third engagement shoulder; and

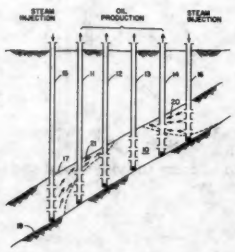
retainer means for retaining said locking dog with said slide member so that said locking dog is moved by said slide member.

4,627,493

STEAMFLOOD RECOVERY METHOD FOR AN OIL-BEARING RESERVOIR IN A DIPPING SUBTERRANEAN FORMATION

Bassem R. Alameddine, Carrollton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 27, 1986, Ser. No. 822,556
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—263 **9 Claims**



1. A method for enhancing the rate of oil production from an oil-bearing reservoir within a dipping subterranean formation, comprising the steps of:

(a) penetrating said dipping formation with a plurality of production wells,

(b) injecting steam into said dipping formation above the upper-most one of said production wells to heat the oil-bearing reservoir within said formation, and

(c) co-injecting steam into said dipping formation below the lower-most one of said production wells, the injection of steam above the upper-most production well exhibiting a gas cap effect on the oil-bearing reservoir and the injection of steam below the lower-most production well exhibiting a fluid drive with an override effect on the oil-bearing reservoir, thereby increasing the growth rate of steam surrounding said reservoir and accelerating the rate of heat communication to said reservoir.

4,627,494

METHOD OF USING A LIGNOSULFONATE/CARBOHYDRATE SYSTEM AS A SACRIFICIAL AGENT FOR SURFACTANT FLOODING

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 4, 1985, Ser. No. 707,990
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 16 Claims

1. A method of recovering hydrocarbons from a subterranean hydrocarbon formation which is penetrated by at least one injection well and at least one production well wherein chemicals are injected into the formation to sweep oil through the formation to at least one production well, which comprises:

injecting into the formation a solution containing about 0.1% to about 10% by weight of a mixture of at least two sacrificial agents designed to prevent the loss to the formation of said injected chemicals,

said mixture of at least two sacrificial agents comprised of one sacrificial agent which is a lignosulfonate and a second sacrificial agent selected from the group consisting of alkoxylated starch, esterified starch, oxidized starch, phosphated starch, alkoxylated cellulose, carboxyalkyl cellulose, carboxyalkylalkoxylated cellulose, alkylalkoxylated cellulose, cellulose sulfates, and cellulose acetate sulfates.

4,627,495

METHOD FOR STIMULATION OF WELLS WITH CARBON DIOXIDE OR NITROGEN BASED FLUIDS CONTAINING HIGH PROPPANT CONCENTRATIONS

Phillip C. Harris; Vincent G. Reidenbach, both of Duncan, Okla., and Pat T. Chisholm, Portland, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 4, 1985, Ser. No. 719,669
Int. Cl.[4] E21B *43/267*
U.S. Cl. 166—280 32 Claims

1. A method of fracturing a subterranean formation penetrated by a well bore comprising:

admixing an aqueous liquid containing varying quantities of a proppant material and a gelling agent with liquid carbon dioxide and a surfactant which is present in an amount sufficient to form an emulsion, said emulsion having an internal phase ratio of from about 50 to in excess of about 96 percent;

adjusting the volume of carbon dioxide admixed with said aqueous liquid to at least substantially maintain said internal phase ratio constant as the quantity of said proppant is varied whereby the viscosity of said emulsion is caused to remain substantially unchanged as the quantity of said proppant varies;

introducing said emulsion into said well bore penetrating said subterranean formation at a temperature below the critical temperature of carbon dioxide and under sufficient pressure to maintain the carbon dioxide as a liquid and cause a fracture to be formed in said subterranean formation;

maintaining said emulsion within said formation for a sufficient time to permit said emulsion to be heated to a temperature above the critical temperature of carbon dioxide to form a foam from said emulsion, said foam having a viscosity immediately after formation which is substantially the same as the viscosity of the emulsion; and

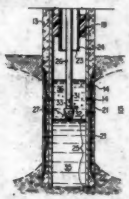
depositing at least a portion of said proppant material in said subterranean formation with said foam.

4,627,496

SQUEEZE CEMENT METHOD USING COILED TUBING

James D. Ashford; Terry W. Harrison; James K. Eastlack, all of Anchorage; Curtis G. Blount, Wasilla; Gary D. Herring, Anchorage, all of Ak., and David R. Underdown, Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 29, 1985, Ser. No. 760,259
Int. Cl.[4] E21B *31/13*
U.S. Cl. 166—292 21 Claims



8. A method of squeeze cementing a well wherein said well has a casing throughout the wellbore, casing cement between said casing and the wellbore of said well, perforations through said casing and said casing cement to establish fluid communication between the interior of said casing and a formation adjacent said perforations, channels in said casing cement in fluid communication with at least some of said perforations, a well tubing string in said casing extending from the surface to the proximity of said perforations, and a packer means for sealing between said tubing and said casing above said perforations, said method comprising:

isolating said casing adjacent said perforations;

lowering a coiled tubing down said well tubing string to a point adjacent said peforations;

flowing uncontaminated squeeze cement through said coiled tubing and through said perforations into said channels;

flowing a cement contaminating liquid down said coiled tubing to mix with the squeeze cement remaining in said casing;

allowing said uncontaminated squeeze cement in said channels to harden; and

removing said contaminated squeeze cement from said casing through said coiled tubing.

4,627,497

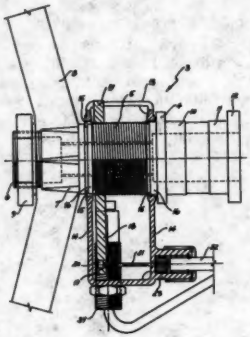
STOP VALVE ALARM FOR SPRINKLER SYSTEM

Barry F. Byrne, Killarney Heights, Australia, assignor to Wormald International Ltd., New South Wales, Australia

Continuation of Ser. No. 470,985, Mar. 1, 1983, abandoned. This application Feb. 28, 1986, Ser. No. 837,337
Claims priority, application Australia, Mar. 5, 1982, PF2996
Int. Cl.[4] G08B *21/00*
U.S. Cl. 169—23 2 Claims

1. A supervisory alarm accessory for a fire sprinkler stop valve of the type including a rotatable valve actuator driving a valve spindle, said accessory comprising an adaptor sleeve connectable between said actuator and said spindle to rotate with said actuator and said adaptor sleeve having an externally threaded part, a fixed housing supported on said sleeve to permit relative rotation of said sleeve and enclosing said threaded part, a follower threadably engaged with said threaded part and keyed to said housing, said follower being linearly displaceable without rotation with respect to said housing with rotation of said sleeve, an alarm generator, and

activating means supported on said housing and providing an activating connection between said alarm generator and said



follower to initiate an alarm with predetermined displacement of said follower with respect to said housing.

4,627,498

FUSE DESIGN FOR FIRE LIMITERS OR OTHER SAFETY APPLIANCES IN VENTILATION INSTALLATIONS

Erkki Aalto, Kausala; Harri Saukkonen, Kouvola, and Juhani Hässä, Kausala, all of Finland, assignors to Halton Oy, Finland

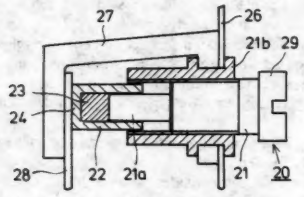
PCT No. PCT/FI83/00069, § 371 Date Jul. 6, 1984, § 102(e) Date Jul. 6, 1984, PCT Pub. No. WO84/01906, PCT Pub. Date May 24, 1984

PCT Filed Nov. 11, 1983, Ser. No. 629,831

Claims priority, application Finland, Nov. 12, 1982, 823899

Int. Cl.⁴ E05F *1/00*

U.S. Cl. 169—42 **11 Claims**



1. A fuse arrangement, comprising

a first part,

a second part,

said first part being constituted by a sleeve-like member disposed about said second part, and

fusible material disposed between said first and second parts and normally maintaining said parts in fixed position with respect to one another when said fusible material is in solid form,

a narrow path being defined in one of said first part, said second part, between said parts, or in said fusible material itself, for flow of said fusible material in molten form, and

mens for urging said first and second parts towards one another, said urging means comprising a fire damper comprising

an outer shell, said second part being secured into said outer shell, and

a clamping arc abutting against said first sleeve-like member,

whereby said parts are caused to move towards one another by said urging means when said fusible material melts and flows through said narrow path,

said parts stop moving when said fusible material stops flowing, and

said parts are again maintained in a new fixed position with respect to one another when said fusible material resolidifies and said fire damper being reclamped by tightening said second part in said shell after said fusible material has resolidified.

4,627,499

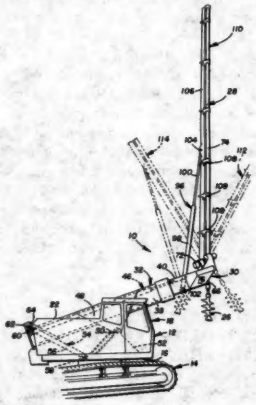
MOBILE DRILLING MACHINE

William E. Magee, 155 Shevlin Rd., Novato, Calif. 94947; Michael Geister, 64 Rock Rd., Kentfield, Calif. 94914, and John N. Dillenburg, Jr., 1249 Leafwood Heights, Novato, Calif. 94947

Filed Apr. 27, 1984, Ser. No. 604,746

Int. Cl.⁴ E21B *15/04*

U.S. Cl. 173—43 **9 Claims**



1. A heavy duty, mobile drilling machine, comprising

a vehicle with a rotatable turntable, housing means for an operator station and other vehicle components mounted on said turntable and including a boom disposed thereon,

said boom comprising a telescoping portion,

bracket means providing a pivotal mounting for said boom on a forward portion of said turntable,

motor means for pivotally operating said boom, said motor means being interconnected between said boom rearwardly of said pivotal mounting and said turntable, and

an elongated drill implement pivotally interconnected to a forward end of said boom telescoping portion permitting movement of said drill implement into an erect position on said boom, said drill implement being mounted on said forward end of said boom by relatively transverse pivot means for facilitating 360° adjustment of said drill element on said boom and said boom being pivotal on said turntable by said motor means for facilitating operation of said drill implement, said drill implement also being movable into a transport position generally parallel with said boom to facilitate transport without disassembly, the arrangement of said motor means and pivotal mounting for said boom and the arrangement of said boom permitting maximum elevation and lowering of said drill implement on said boom, said telescoping portion of said boom further comprises means within said telescoping portion adapted for receiving ballast in order to selectively increase effective mass of said drill implement during operation.

4,627,500
COAL-COMPACTING POWER-HAMMER ROD ACTIVATOR

Heinz Stegmann, Fischbach, Fed. Rep. of Germany, assignor to Saarberg-Interplan Gesellschaft fur Rohstoff-Energie und Ingenieurtechnik mbH, Saarbrucken, Fed. Rep. of Germany

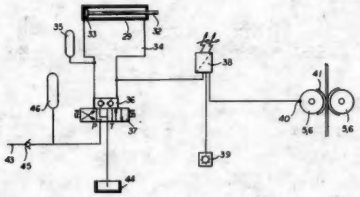
PCT No. PCT/DE82/00136, § 371 Date Feb. 24, 1983, § 102(e) Date Feb. 24, 1983, PCT Pub. No. WO83/00160, PCT Pub. Date Jan. 20, 1983

PCT Filed Jul. 1, 1982, Ser. No. 474,634

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125840

Int. Cl.⁴ C10R *45/02*

U.S. Cl. 173—53 **7 Claims**



1. A coke compactor comprising:

a plurality of power hammers adapted to be raised and dropped to compact coke, each of said hammers being provided with an upstanding rod having a web;

a respective actuator for each of said hammers, each of said actuators comprising:

a pair of cams flanking a web of a respective rod of the respective hammer and bearing against said web, said cams being formed along their periphery with surfaces frictionally entraining the respective web upwardly and surfaces which release the respective web to permit the respective hammer to drop,

respective levers flanking the respective rod rotably carrying said cams, said levers being formed with mutually meshing gear segments whereby the displacement of one lever about a fulcrum constituting an axis of one gear segment causes the other lever to swing oppositely and synchronously for controlled application of said cams against the respective web,

a respective fluid-operated cylinder operatively connected to one of said levers for controlling the force with which said cams are applied against the respective web, and

respective pinions operatively connected to said cams; and

a common drive for all of said actuators, said drive including a gear train meshing with said pinions.

4,627,501
BORER HEAD WITH PLANETARY GEARING

Wolfgang Ebeling, Hanover, Fed. Rep. of Germany, assignor to Turmag-Turbo-Maschinen-Aktiengesellschaft Nuesse & Graefer, Sprockhoevel, Fed. Rep. of Germany

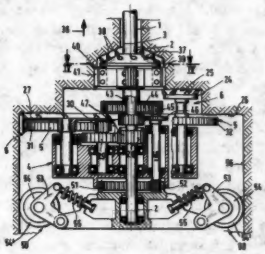
Filed Feb. 22, 1985, Ser. No. 704,291

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406855; Dec. 13, 1984, 3445492

Int. Cl.⁴ E21B *10/12, 10/28*

U.S. Cl. 175—319 **27 Claims**

1. A borer head for drilling boreholes in rock structures, comprising a central shaft (2); a single drill pipe (1) coupled to the central shaft; at least one tool holder (4) carrying cutters thereon; a planetary gearing (28, 29, 30, 31, 32) driving, coupling and rotating said tool holder with said central shaft; and a supporting device (40) operated to press against a cylindrical wall of a borehole being drilled and including a plurality of supporting elements (41, 54, 59, 74) radially symmetrically positioned on the supporting device in respect to said central shaft, said supporting device being coupled by a gearing (44, 45, 46, 47) to said central shaft, on the one hand, and to said



tool holder, on the other hand, so that said tool holder is driven to a slow rotation about said central shaft.

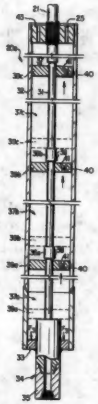
4,627,502
LIQUID-FILLED COLLAR FOR TOOL STRING

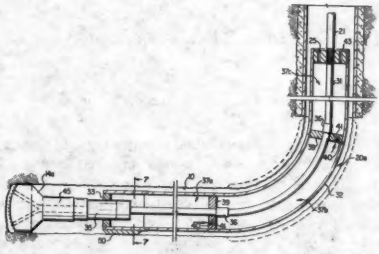
Newton B. Dismukes, 2952 Buttonwood Dr., Carrollton, Tex. 75006

Filed Jul. 18, 1985, Ser. No. 756,785

Int. Cl.⁴ E21B *17/16*

U.S. Cl. 175—320 **26 Claims**





1. A collar adapted to be connected to the nether end of a tool string which, in turn , is to be used in a wellbore filled with a wellbore liquid; said collar comprising:

a body having a long longitudinal annulus extending throughout thereof and being closed at its lower end;

a dense liquid filling at least a portion of said annulus, said dense liquid having a density greater than that of said wellbore liquid; the head of said dense liquid adapted to apply a force onto said lower end closure of said annulus when said collar is in an operable position in a wellbore; and

means for fluid communication between the upper end of said annulus above said dense liquid and said wellbore fluid when said collar is in an operable postion within said wellbore.

22. A fluid continuum means for transmitting a useful portion of the weight of a dense liquid from a substantially vertical wellbore to a substantially horizontal section of said wellbore, said wellbore being filled with a wellbore liquid, said means comprising:

a conduit, said conduit having a closure at the bottom thereof and in fluid communication with said wellbore liquid at the top thereof;

a volume of dense liquid inside said conduit, said dense liquid having a density greater than said wellbore liquid;

a volume of low density liquid in said conduit below said dense liquid, said low density liquid having a density less than said wellbore liquid;

a means in said conduit separating said dense liquid and said low density liquid;

a tool means affixed to said closure; and

a means for advancing said conduit into said wellbore whereby at least a portion of the weight of said dense liquid acts through said liquid continuum to advance said tool means in said horizontal wellbore section.

4,627,503

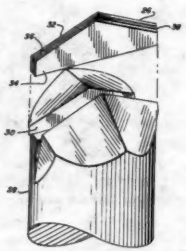
MULTIPLE LAYER POLYCRYSTALLINE DIAMOND COMPACT

M. Duane Horton, Provo, Utah, assignor to Megadiamond Industries, Inc., Provo, Utah

Filed Aug. 12, 1983, Ser. No. 522,896

Int. Cl.[4] E21B *10/46*

U.S. Cl. 175—329 **17 Claims**



7. A cutting element having a center layer of polycrystalline material, an exposed side layer of material having a Young's Modulus less than approximately 45×10^6 psi said side layer being directly bonded to the polycrystalline material layer without an intervening layer, and an exposed opposite side layer of material also having a Young's Modulus less than approximately 45×10^6 psi and said opposite side layer also being directly to the polycrystalline material layer without an intervening layer.

4,627,504

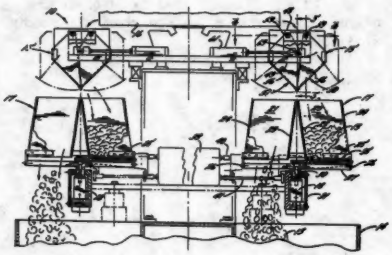
METHOD FOR TAKING TARE WEIGHTS IN AUTOMATIC COMBINATION WEIGHING MACHINES

Michael J. Moran, Raleigh, N.C., assignor to USM Corporation, Farmington, Conn.

Filed Jun. 7, 1985, Ser. No. 742,553

Int. Cl.[4] G01G *19/22, 13/24, 13/14*

U.S. Cl. 177—1 **9 Claims**



1. A method of measuring tare weights in an automatic combination weighting machine having N weighing buckets with each bucket having at least two compartments of which only one is filled at any given time with produce whose weight is a fraction of a target weight, said method comprising the steps of:

(a) measuring the gross weight of each of the N buckets;

(b) subtracting a stored predetermined tare weight of each bucket form the gross weight in order to find the net weight of the producet held in the filled compartment of each bucket;

(c) dumping the product from the filled compartment of the M buckets which contain the combination of M net weights whose total weight most closely approximates said target weight, where M is less than or equal to N;

(d) refilling the previously empty M buckets with product;

(e) repeating the weight cycle defined by steps a, b, c, and d so as to create a cyclic repetition of finding combinations of net weights which most closely approximate the target weight;

(f) interrupting said cyclic repetition after step (c) but before step (d) in a given cycle;

(g) measuring the tare weight of the M buckets emptied in the given cycle and replacing the stored tare weight values for these M buckets with the measured tare weight values;

(h) filling the M buckets with product; and

(i) resuming the cyclic repetition of step e by sequentially executing steps a, b, c and d.

4,627,505

WEIGHING APPARATUS AND METHOD FOR AUTOMATICALLY MONITORING A CONSTANT CURRENT SOURCE

Peter Kunz, Gossau, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Jun. 12, 1985, Ser. No. 743,905

Claims priority, application Switzerland, Jun. 29, 1984, 3140/84

Int. Cl.[4] G01G *7/00;* G01L *1/08*

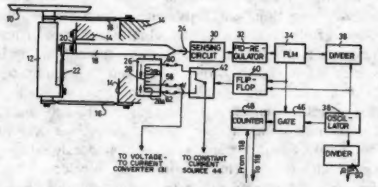
U.S. Cl. 177—1 **6 Claims**

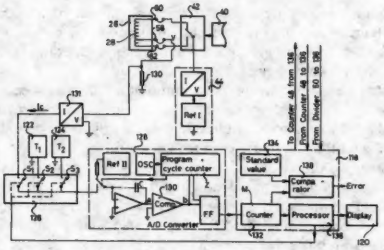
1. In a weighing apparatus for the load-compensation type including a frame; load support means connected for movement from a normal no-load position relative to said frame; load compensation means including a compensation coil connected with said load support means, permanent magnet means connected with said frame adjacent said compensation coil, and position-responsive means operable upon the application of a load to the load support for periodically supplying com-

pensation current pulses from a constant current source (44) to the compensation coil to displace the load support means towards its initial no-load position; and means for digitally processing and displaying the magnitude of the applied load as a function of the compensation current supplied to the compensation coil;

the improvement which comprises

function error recognition means for generating an error





signal when the current of said constant current source deviates a given extent from a standard value, including

(a) means including analog-to-digital converter means (128) for producing a periodically digitized signal that is a function of the current supplied by said constant current source; and

(b) means (118) including comparison means (138) for generating an error signal when the digitalized current differs by a given amount from a standard value.

4,627,506

BATCH WEIGHING APPARATUS

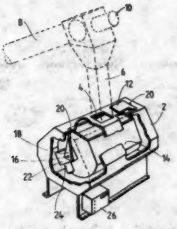
Niels S. Veng, Glyngöre, Denmark, assignor to Brdr. Skov A/S, Glyngöre, Denmark

Filed Jul. 25, 1984, Ser. No. 634,065

Claims priority, application Denmark, Jul. 29, 1983, 3475/83

Int. Cl.[4] G01G *19/22, 19/00, 13/14*

U.S. Cl. 177—25 **3 Claims**



1. A weighing apparatus of the batch weighing type for receiving a flow of a material such as feedstuff and for summarized weight determination of successively discharged portions of the material, comprising an automatically dischargeable weighing container connected with a real weighing system for absolute weighing of each material portion before and after discharge thereof to obtain automatic taring in connection with the weighing of each material portion, said weighing system having means for producing a control signal for effecting temporary stoppage of the supply flow of the material when a coarse weight has been reached in response to the container being filled to a predetermined load and means for shortly thereafter effecting an accurate weighing of the container and transferring the weighing result into an associated summarizing register upon correction for the weight of an empty container, a control unit operable for actuating discharging of the container subsequent to the weighing and for restarting of the supply flow of the material when the container is ready to receive the next material portion, and means included in the container system suspended in a weighing cell system and comprising a gear motor for tilting the weighing container between a receiving position and a discharge position.

4,627,507

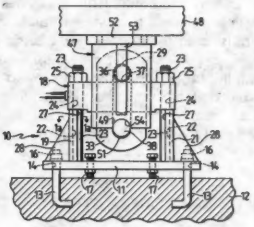
MOUNTING FOR DOUBLE-ENDED SHEAR BEAM LOAD CELLS

David L. Powell, Stayton, Oreg., and Philip W. Bair, Jasper, Ala., assignors to Powell All-Steel Scales, Inc., Jasper, Ala.

Filed Aug. 19, 1985, Ser. No. 766,509

Int. Cl.[4] G01G *3/14, 21/24*

U.S. Cl. 177—211 **14 Claims**



1. Apparatus for mounting a double-end shear beam load cell for use in a scale comprising:

(a) means for supporting said load cell in a predetermined position and orientation;

(b) an upper pin adapted for engagement with said load cell over a specified area and positioned above said load cell;

(c) a lower pin positioned beneath said load cell and parallel to said upper pin, said lower pin receiving the weight of said load; and

(d) link means for connecting the ends of said upper pin to said lower pin with said lower pin supported by said upper pin and said lower pin being free to oscillate responsive to the forces exerted on said lower pin in said scale, such that the force transferred to said load cell remains substantially constant in direction and area of application.

4,627,508

STEP-NEGOTIATING VEHICLE

Peter Auer, Ausserdorf 3, 8479 Truttikon, Switzerland

Filed Dec. 11, 1984, Ser. No. 680,476

Claims priority, application Switzerland, Dec. 12, 1983, 6618/83

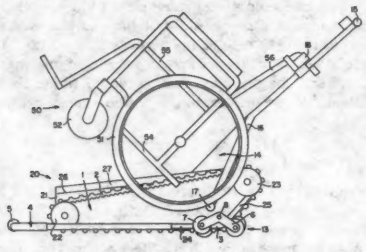
Int. Cl.[4] B60B *5/02;* **B62D** *55/02*

U.S. Cl. 180—9.22 **30 Claims**

1. A step-negotiating vehicle for transporting a wheelchair, up or down a series of steps, said wheelchair having two axially aligned wheels and a user support structure, and said vehicle comprising:

a chassis having a bottom surface, a top surface and first and second sides wherein said chassis extends beneath the user support structure and between the axially aligned wheels of said wheelchair when said wheelchair is loaded upon said vehicle;

a track drive assembly on said chassis, said track drive assembly comprising power supply means, a motor powered by said power supply means, transmission means operatively connected to said motor, at least two drive rollers connected to said transmission means to be rotatively driven thereby, drive tracks mounted to said drive rollers



to be driven thereby, and track guide means for guiding the drive tracks;

at least one extension means removably mounted to said chassis and extending from the sides of said chassis in proximal relation to said bottom surface and extending laterally from the sides of said chassis beyond the periphery of said chassis, said extension means providing additional lateral and longitudinal support for said chassis for enhanced stability of said vehicle; and

roller means mounted to said chassis to support said vehicle when said vehicle is positioned on a flat surface.

4,627,509

POWER ASSISTANCE STEERING SYSTEMS FOR VEHICLES

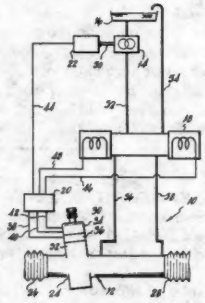
Frederick J. Adams, Clevedon, and Kenneth J. D. Heap, Cheddar, both of England, assignors to TRW Cam Gears Limited, Clevedon, England

Filed Apr. 26, 1985, Ser. No. 727,822

Claims priority, application United Kingdom, May 5, 1984, 8411607

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—142 **4 Claims**



1. A power assistance steering system for a vehicle comprising:

a fluid pressure device for providing steering power assistance and having opposite chambers;

a fluid pump for providing fluid pressure directed to said fluid pressure device;

a variable speed electric motor for driving said fluid pump at different speeds to provide for variations in fluid pressure directed from said fluid pump;

solenoid operated valve means for selectively controlling fluid flow from said fluid pump to said opposite chambers of said fluid pressure device in accordance with a desired steering direction, said valve means being movable between a fully open position in which fluid flows from said fluid pump to a respective opposite chamber and a closed position in which fluid flow from said fluid pump to said fluid pressure device is blocked; and

sensor means for sensing a steering torque and for generating a signal in response to the steering torque for controlling the speed of said variable speed electric motor in accordance with the steering torque to thereby control variations in fluid pressure directed from said fluid pump to said solenoid operated valve means.

4. A power assistance steering system for a vehicle comprising:

a fluid pressure device for providing power assistance to steering and having opposite chambers;

a fluid pump for providing fluid pressure directed to said fluid pressure device;

motor means for driving said pump at a constant speed;

solenoid operated valve means for selectively controlling fluid flow from said fluid pump to said opposite chambers of said fluid pressure device in accordance with a desired steering direction, said valve means being movable between a fully open position in which fluid flows from said fluid pump to a respective opposite chamber and a closed position in which fluid flow from said fluid pump to said fluid pressure device is blocked;

a proportional pressure control valve means located upstream of said solenoid operated valve means and downstream of said fluid pump for controlling variation in fluid pressure directed to said solenoid operated valve means; and

sensor means for sensing a steering torque and for generating a signal in response to the steering torque for controlling operation of said proportional pressure control valve means.

4,627,510

HYDRAULIC ASSISTED STEERING FOR MOTOR VEHICLES

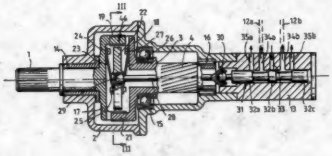
Gérard Camus, Cormeilles-en-Parisis, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly sur Seine, both of France

Filed Dec. 21, 1984, Ser. No. 684,903

Claims priority, application France, Dec. 23, 1983, 83 20977

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—148 **11 Claims**



1. A hydraulic-assist steering apparatus for an automotive vehicle having steerable wheels, a steering linkage connected to said wheels, and a hydraulic-assist cylinder connected to said wheels and adapted to be supplied with fluid for hydraulically displacing said linkage, said apparatus comprising in combination:

a housing;

a control shaft in said housing rotatable to initiate steering movement of said wheels;

a follower shaft positioned in said housing so as to be rotatably entrained by rotation of said control shaft, but with freedom of limited relative angular displacement therebetween, each of said shafts being operatively connected rotationally with a respective one of a pair of axially juxtaposed relatively rotatable members in said housing;

an intermediate element axially juxtaposed in said housing with said members and received between them with freedom of axial movement relative to said members;

a plurality of first elongated flexible blades in said housing oriented obliquely in one rotational direction and peripherally coupling said intermediate element to one of said members, and a plurality of second elongated flexible blades in said housing oriented obliquely in an opposite rotational direction and peripherally coupling said intermediate element to the other of said members, whereby upon relative angular displacement of said shafts said intermediate element moves axially toward one or the other of said members depending upon the direction of said relative angular displacement;

a slide valve having a moveable valve slide on said housing axially aligned with said members and said element; and

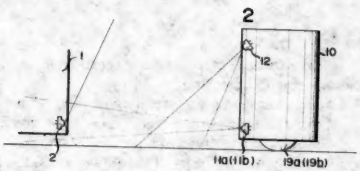
means in said housing axially connecting said slide with said intermediate element.

4,627,511

OPTICAL TRACKING ROBOT SYSTEM

Hiroshi Yajima, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1985, Ser. No. 785,162
Claims priority, application Japan, Oct. 18, 1984, 59-217237
Int. Cl.[4] B62D 1/00
U.S. Cl. 180—167 **10 Claims**



1. An optical tracking robot system comprising:

light emitting means attached to a target, said light emitting means including a source of operating voltage; at least one light emitting element coupled to said operating voltage source for emitting a light beam modulated into pulses; and modulator means for modulating the operating voltage of said light emitting element impulses;

tracking sensor means for monitoring the light beam emitted from said light emitting means and including means for generating drive control signals to determine the drive direction of a tracking robot;

approach sensor means including a light receiving element provided at a front portion of the tracking robot at a different height from said light emitting element, for detecting an approach to the target; aperture means provided in front of said light receiving element for restricting the light receiving area of said light receiving element such that an approach detection distance from the target can be adjusted to a desired value; an amplifier detector means including means for amplifying pulse signals received by said light receiving element, means coupled to said amplifying means for demodulating the amplified signals by means of a band-pass filter, and output means coupled to said demodulating means for generating an output signal; and comparator means for comparing the level of the output signal generated by said output means of said amplifier detector means with a predetermined threshold level and generating stop control signals to stop the tracking robot based on the result of said comparison when the tracking robot approaches the target;

travel control means for receiving said drive control signals from said tracking sensor means and said stop control signals from said approach sensor means and for generating drive signals and stop signals; and

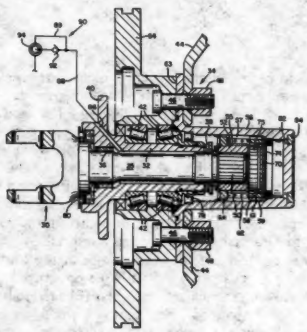
driver means for driving the tracking robot in response to said drive signals from said travel control means and for stopping the robot in response to said stop signals from said travel control means.

4,627,512

AIR ACTUATED CLUTCH FOR FOUR WHEEL DRIVE VEHICLES

Kip E. Clohessy, Portland, Oreg., assignor to Warn Industries, Inc., Bellevue, Wash.

Filed Apr. 12, 1985, Ser. No. 722,659
Int. Cl.[4] F16D 43/28
U.S. Cl. 180—247 **10 Claims**



1. A control system for selectively engaging and disengaging a vehicle wheel and a vehicle drive mechanism comprising;

a spindle having inside and outside rotative support surfaces, said spindle adapted to be mounted to a vehicle frame, an axle portion rotatably supported on the inside support surface, and drive means for selectively and rotatively driving said axle portion relative to said spindle;

a wheel hub assembly adapted to carry a vehicle wheel, said hub assembly rotatively supported on the outside support surface of said spindle, a first set of gear teeth provided on said axle portion and a second set of gear teeth provided on said hub assembly, and a clutch ring having first and second sets of gear teeth that mate with the first and second sets of gear teeth on the axle portion and hub assembly, said clutch ring being mounted on one of the axle portion and hub assembly in gear meshing relationship with the gear teeth thereof, and being movable between a gear meshing interlocking relationship and a non-gear meshing unlocking relationship with the gear teeth of the other of the axle portion and hub assembly;

a sealed expansion chamber defined in part by the spindle, the axle portion, the hub assembly and a movable wall carried by the hub assembly, venting means venting the outer side of the movable wall to atmospheric pressure, said clutch ring engaged by said movable wall for movement of the clutch ring with movement of the movable wall as induced by a pressure difference generated within said chamber, and pressurizing means for selectively pressurizing and depressurizing the expansion chamber to thereby selectively shift the clutch ring between the positions of interlocking the axle portion and hub assembly and unlocking the axle portion and hub assembly.

4,627,513

INTERMEDIATE DIFFERENTIAL FOR A VEHICLE INCLUDING A SPUR GEAR/PLANETARY GEAR ARRANGEMENT

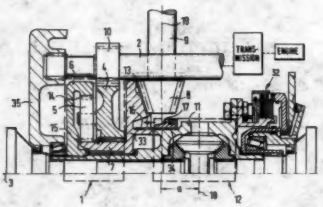
Peter Tutzer, Kornwestheim, Fed. Rep. of Germany, assignor to Dr. Ing h.c.F. Porsche AG, Stuttgart, Fed. Rep. of Germany

Filed May 18, 1984, Ser. No. 611,855

Claims priority, application Fed. Rep. of Germany, May 19, 1983, 3318251

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—249 **21 Claims**



1. A spur gear-planetary gearing means arrangement for use as a power transfer differential mechanism for an engine-driven four-wheel drive vehicle having a first and second axle and a transmission means for transferring power from the engine to said first and second axles, and wherein an output shaft of the engine is disposed transversely to the longitudinal axis of the vehicle and substantially parallel to an output shaft of the transmission means, said first and second axles being driven from the transmission means through a power-divider transfer differential gearing means comprising:

a planetary gear carrier (4) having outside toothing driven by a spur gear (10) driven by said output shaft of the transmission means, a planet gear (5) carried by said planetary gear carrier (4), ring gear (6), and a sun gear (7), said planet gear (5) being arranged for asymmetrical load distribution for driving said ring gear (6) and said sun gear (7), said ring gear (6) driving said first vehicle axle through a differential gear means, said sun gear (7) driving said second axle through a gearing drive means, and clutch means to drivingly connect the differential gear means to said gearing drive means.

4,627,514

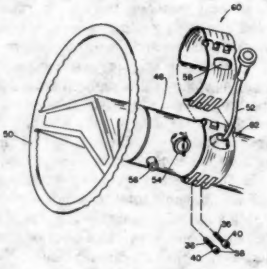
VEHICLE ANTI-THEFT DEVICE

Clarence Brown, 7358 Hurtgen Forest, Houston, Tex. 77033

Filed Apr. 24, 1985, Ser. No. 726,662

Int. Cl.[4] B60R *25/02*

U.S. Cl. 180—287 **7 Claims**



1. An anti-theft device for use on an automobile steering column comprising:

a pair of rigid, semi-circular band portions hingedly connected along their respective first end edges and adpated for encircling the steering column in close surrounding relationship when their respective second end edges are brought together;

a pair of opposed flanges, each of said flanges being mounted on one of said band portions adjacent its first end edge, said flanges having a pair of aligned openings;

a screw for insertion through one of said aligned openings and threaded engagement of the other of said aligned openings to secure said band portions when their respective second end edges are brought together; and

a pair of laterally spaced reinforcing bands mounted on one of said band portions to prevent lateral access to the head of said screw with a pair of pliers or the like.

4,627,515

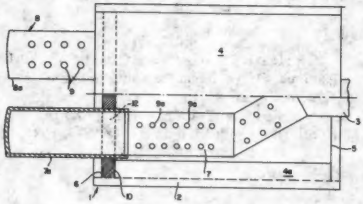
EXHAUST DEVICE

Luigi D'Alessandro, Geerenstrasse 12, CH-8157 Dielsdorf, Switzerland

Continuation-in-part of Ser. No. 659,085, Oct. 1, 1984, abandoned. This application Aug. 13, 1985, Ser. No. 765,260

Int. Cl.[4] F01N *1/10*

U.S. Cl. 181—258 **8 Claims**



1. An exhaust device for transporting exhaust gases of a motor vehicle, comprising

a housing having a wall defining an interior and an exterior,

a tube, for transporting said gases, a portion of said tube within said housing and a portion of said tube outside said housing, the portion of said tube outside said housing being closed at its end and having at least one aperture around its periphery, the portion of said tube within said housing also having at least one aperture around its periphery,

a filter in fluid communication with the interior of said tube, and

a second filter in fluid communication with the interior of said tube, said second filter being disposed along the interior wall of said housing.

4,627,516

SELF-LEVELING LADDER CONSTRUCTION

Lewis O. Studer, Summerfield, Ohio, assignor to Harry V. Moore, Walkerville, Mich., a part interest

Filed Jan. 2, 1986, Ser. No. 815,557

Int. Cl.[4] E06C *7/44*

U.S. Cl. 182—202 **13 Claims**

1. A self-leveling ladder construction including:

(a) a pair of spaced vertical rung supporting members;

(b) a leg axially slidably mounted within each of the rung supporting members at the bottom of each of said supporting members;

(c) a rack affixed to each of said legs;

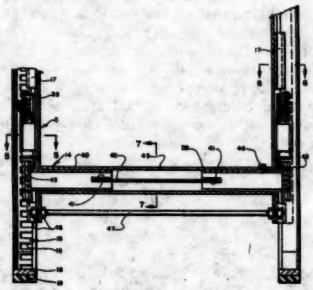
(d) a rotatably mounted gear engaging each of said racks;

(e) drive means interconnecting the gears for simultaneous rotation in the same direction, said gears engaging the racks on opposite sides of the gears whereby movement of

one of the legs in one direction produces an opposite movement of the other leg;

(f) gear lock means mounted on each of the rung supporting members adjacent each of the gear for engaging the gears to releaseably lock the gears in a selected position; and

(g) said drive means including a stub shaft attached to each of the gears, a tubular telescoping member extending



generally between the rung supporting members adapted to function as a lower rung and conected to one of the stub shafts for rotation with said shaft, and a leaf spring extending between and in engagement with the stub shafts within said tubular telescoping member, said stub shafts having outer diameters generally equal to the inner diameter of the telescoping member whereby said stub shafts support said telescoping member.

4,627,517

STAIRLIFT

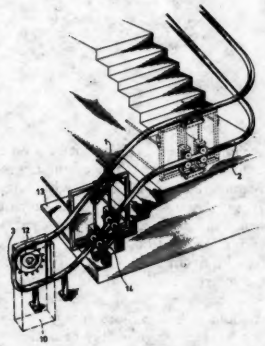
Jan H. Bor, van Boeyenplantsoen 21, 2253 WS Voorschoten, Netherlands

Filed Feb. 13, 1985, Ser. No. 701,082

Claims priority, application Netherlands, Feb. 13, 1984, 8400458

Int. Cl.[4] B66B *9/06*

U.S. Cl. 187—12 **12 Claims**



1. Stairlift provided with an endless tubular guide track in the form of two parallel rails one above the other and two connecting parts, with at least the top rail having a groove running parallel to the center line of the tube, a series of transmission elements inside the guide track, a toothed wheel which is driven by a motor and the teeth of which can engage via said groove with an aperture in each transmission element, and a carrying platform which is designed for carrying persons or goods and is connected to a carriage whose top end is attached to a roller or the like which moves inside the top rail, and whose bottom end is conducted by guide elements relative to the outer surface of the bottom rail, characterized in that the carriage consists of a parallelogram of vertical bars (15) and crossbars (16), and crossbars (16) being hingedly connected with the vertical bars (15) about a vertical and about a horizontal axis, and in that the carrying platform (13) is hingedly connected with a point on each (26) of the crossbars (16) located more or less directly above one another.

4,627,518

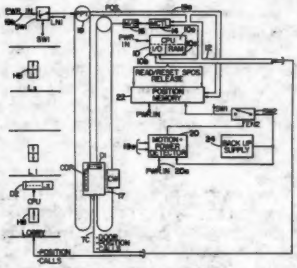
BACKUP POSITION SIGNALING IN AN ELEVATOR

Gary M. Meguerdichian, Waterbury, and Isabel B. Hovey, Bristol, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 25, 1985, Ser. No. 727,313

Int. Cl.[4] B66B *3/02*

U.S. Cl. 187—29 R **3 Claims**



1. An elevator comprising a car, a car controller, and position transducer connected to a car for providing distinct car position signals, a source of system power, the elevator being characterized by:

position memory means for storing position signals from the transducer therefrom for retrieval by the controller after the controller is shut down and restarted;

a backup power supply;

first switch means for connecting the supply to the position memory means in response to a first control signal;

second switch means for connecting the power supply to the position sensor in response to a second control signal;

logic means for receiving a car position signal from the position transducer for sensing system power level and providing said first and second control signals when the level decreases below a reference level.

4,627,519

HYDRAULIC DISK BRAKE HAVING A BRAKING TORQUE-TO-HYDRAULIC FORCE CONVERTER

Lorin V. Larsen, Long Beach, and Brian L. Eidem, Cerritos, both of Calif., assignors to Armco Inc., Middletown, Ohio

Filed Mar. 29, 1984, Ser. No. 594,795

Int. Cl.[4] B60T *13/12;* **B66D** *1/44*

U.S. Cl. 188—1.11 **13 Claims**

1. A disk brake apparatus for a cable hoisting drum mounted for rotation and having a brake disk coupled for rotation therewith, the combination comprising:

a support located adjacent the drum;

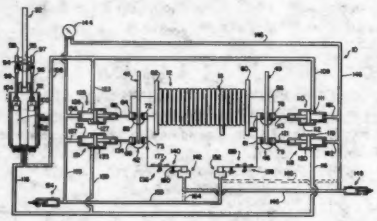
a pair of brake calipers having an opposed pair of friction pads thereon located on opposite sides of the brake disk, and having a pair of hydraulic rectilinear motors for driving said pads against the brake disk;

means for coupling said calipers to said support;

a hydraulic fluid pump having an actuating lever movable between first and second positions and generating a hy-

draulic force proportional to the location of said lever between said first and second positions;

hydraulic fluid lines interconnecting said pump and said motors for delivering said hydraulic force to each of said motors and thus to said friction pads as generated by said actuating lever; and



adjustable converter means, coupled to said pair of brake calipers and to said hydraulic fluid lines, for converting the braking reaction force caused by the torque applied to said calipers, when said friction pads engage the rotating disk, to an additional hydraulic force proportional to the amount of torque so applied to said calipers and applying this additional hydraulic force to said motors.

4,627,520

FRONT BRAKE APPARATUS IN MOTORIZED THREE-WHEELED VEHICLE

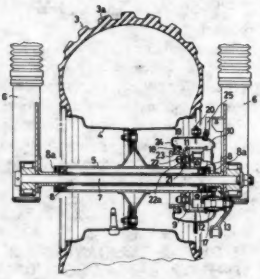
Shinji Matsubayashi, Tokyo; Satoru Kiyota, Yokohama, and Eiji Hosoya, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 550,146, Nov. 9, 1983, abandoned. This application Sep. 9, 1985, Ser. No. 774,187

Claims priority, application Japan, Nov. 11, 1982, 57-169824[U]

Int. Cl.[4] B60T *1/06*

U.S. Cl. 188—18 R **3 Claims**



1. A front brake and wheel supporting apparatus for a front wheel of a three wheeled vehicle said wheel including a rim, said vehicle having a pair of front forks, said apparatus comprising:

an axle fixedly provided between the pair of front forks,

a pair of bearings, each mounted on said axle near one of said front forks,

a wheel hub rotatably mounted on and extending between said pair of bearings, the wheel being attached to said wheel hub,

a drum setting plate fixed to and extending radially from said wheel hub, said drum setting plate being positioned axially inwardly of a circumferential edge of the rim of the wheel and having an axially outwardly facing surface and an outer circumference,

a brake drum bolted to said outwardly facing surface,

a brake panel fixed to said wheel axle and positioned substantially axially outwardly of said brake drum and substantially axially outwardly of the circumferential edge of the rim, said panel having a radially outer circumferential portion extending axially inwardly to a position which is axially inwardly of the circumferential edge of the rim,

brake shoes provided on said brake panel arranged to be brought into internal contact with said brake drum,

a drum cover attached to said radially outer circumferential portion of said brake panel and extending to cover a surrounding portion of said brake drum,

a drum side seal receiving member integrally formed along said outer circumference of said drum setting plate and extending axially inwardly thereof substantially in parallel to and separate from said wheel hub,

a cover side seal receiving member facing said drum side seal receiving member and being formed of a nearly U-shaped cross-sectional bent end portion of said drum cover, and

a seal member interposed between said drum side seal receiving member and said cover side seal receiving member, said seal member comprising: an outer member, and an inner support plate encased in said outer member and being bent into a channel form having a curved portion of U-shape in section opening in an axial direction to take up deformation of said drum side seal receiving member in a radial direction.

4,627,521

MOTOR AND BRAKE CONTROLS

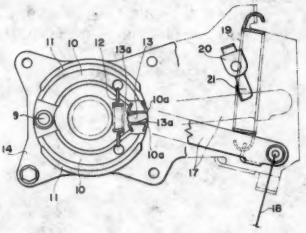
Katsumi Takagaki, Urawa; Yukinori Ito, Kawagoe, and Kiyohide Sumi, Koga, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,114

Claims priority, application Japan, Jun. 28, 1983, 58-116611

Int. Cl.[4] B60K *41/20*

U.S. Cl. 192—2 **9 Claims**



1. In a motor and brake control device for an engine having a flywheel secured to a crankshaft of the engine so that the flywheel turns and respectively stops with turning and stopping respectively of the crankshaft, a crankcase, a flywheel magneto having magnetic steel at the periphery of the flywheel, the improvement comprising

an annular brake drum formed on said flywheel having an inner circumference of said brake drum comprising a braking surface,

a pair of expandable brake shoes engageable with the braking surface for stopping the flywheel, the crankshaft and the engine,

an actuating member engaged with an end of each brake shoe, said actuating member being mounted movably so as to expand said brake shoes into engagement with the braking surface to brake said drum,

a spring disposed between said shoes for biasing said shoes so that said end of each brake shoe engages said actuating member,

switch means for shutting off the engine,

a supporting plate secured to said crankcase axially adjacent

to said flywheel and substantially perpendicular to the axis of the flywheel,

said supporting plate constitutes means for supporting another end of each said brake shoe, one end of said actuating member, and said switch means such that the latter is operated by the actuating member by movement of the latter, and

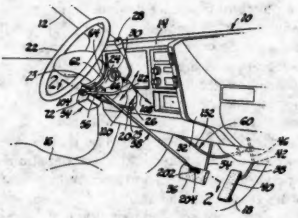
said actuating member, said brake shoes and said switch means being so arranged on said supporting plate adjacent said flywheel with a minimum axial length of the device providing a compact construction, said brake shoes being disposed inside said annular brake drum.

4,627,522

HAND ENGINE AND BRAKE CONTROL MECHANISM FOR A VEHICLE

Paul L. Ulrich, Redford; James Richards, Sterling Heights, and Eugene T. Tanke, II, Vassar, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1984, Ser. No. 680,977
Int. Cl.[4] G05G *9/04;* B60K *41/20*
U.S. Cl. 192—35 **1 Claim**



1. A hand operated engine throttle and vehicle brake control mechanism for a passenger vehicle having a steering column capable of axial movement or collapse under impact and including a tiltable column section, a steering wheel on said steering column tiltable column section, an instrument panel through which said steering column extends, a brake pedal suspended below the instrument panel on a brake pedal arm for brake actuating movements generally parallel to the steering column, an accelerator pedal mounted below the instrument panel and positioned for operation by foot in the usual manner, said accelerator pedal and having a pedal and lever forming a part of the engine control linkage, the pedal lever extending under and behind the instrument panel and being pivoted so that depression of the accelerator pedal by a vehicle operator causes a portion of the pedal lever to pivotally move generally toward the steering wheel to increase engine speed and/or power, said mechanism comprising:

a hand control body assembly secured to said steering column tiltable column section immediately below said steering wheel, said body assembly having a pilot lever input member movable by a hand of the vehicle operator throughout a generally rectangular pattern defined by an engine control plane of movement generally parallel to said steering wheel and a brake control plane of movement perpendicular to said engine control plane of movement and limit positions of engine control from idle to full speed and limit positions of brake control from brake release to full brake application;

said body assembly also having a push-pull cable output member movable axially between limit positions of engine control from idle to full speed and a brake rod output member movable axially between limit positions of brake control from brake release to full brake application;

said body assembly having a rotatably movable first shaft mounted therein and connected with said pilot lever input member, said first shaft being rotationally responsive only to components of said pilot lever input member movements in the rectangular pattern which are in or parallel to said engine control plane of movement to axially move said push-pull cable;

a gear sector mounted on said first shaft for arcuate movement therewith;

a second shaft rotatably mounted in said body assembly axially parallel to said first shaft, said second shaft having a gear thereon engaging said gear sector in gear driven relation;

a first pulley rotatably mounted in body assembly with the axis of said first pulley being between and perpendicularly skew to the axis of said first and second shafts;

a second pulley secured to said second shaft to be rotatably driven thereby and having a peripheral groove with said push-pull cable laid wherein with one cable end secured to said second pulley;

said first pulley having a peripheral groove positioned in perpendicular tangential alignment with said second pulley peripheral groove with said push-pull cable also being laid therein and positioned in free leading relation from said second pulley peripheral groove;

said body assembly having cable guide means through which said push-pull cable extends from said first pulley in general axially parallel relation to the axis of said first shaft and passes outwardly of said body assembly;

said push-pull cable having another end remote from said body assembly and a lost motion connection by which said cable another end is connected to said pedal lever under and behind said instrument panel for causing said pedal lever portion to move generally toward the steering wheel to increase engine speed and/or power and permitting return movements thereof to the engine idle limit position, said lost motion connection permitting axial movements of said cable in the increasing throttle opening direction to cause corresponding throttle control linkage throttle openings movements and axial movements of said cable in the decreasing throttle opening direction permitting the throttle control linkage to move in the throttle closing direction, said lost motion connection permitting throttle control linkage throttle opening movements via the accelerator pedal independently of said input control member without moving said cable;

said body assembly having torsion spring means secured therein and acting torsionally on said first shaft and continually urging said first shaft and said gear sector and said second shaft and said second pulley and said push-pull cable toward the engine idle limit position;

said body assembly also having an adjustable length brake rod pivotally attached to said pilot lever input member at one rod end and to said brake pedal at the other rod end and responsive only to components of said pilot lever input member movements in the rectangular pattern in or parallel to said brake control plane of movement for causing said rod to move to depress said brake pedal in the brake apply direction of pedal movement and to return to the brake release limit position upon movement of said pilot lever input member to its brake release limit position;

said brake rod extending generally parallel to and closely adjacent to the steering column and having its pivotally connected ends so positioned axially and translationally relative to the tiltable steering column section as to accommodate full tilting movement of said tiltable column section without effecting axial rod movement and to also accommodate brake applications via the brake pedal independently of said input control member without effecting any axial movement of said push-pull cable;

said accelerator pedal and said brake pedal by virtue of said push-pull cable, said lost motion connection, and the position of said brake rod pivotally connected ends, being movable independently of said hand control mechanism to control the engine and the vehicle brakes, said control mechanism being unaffected by tilting and axial movements of said steering wheel insofar as its functional capa-

bility to control said accelerator pedal and said brake pedal is concerned.

4,627,523

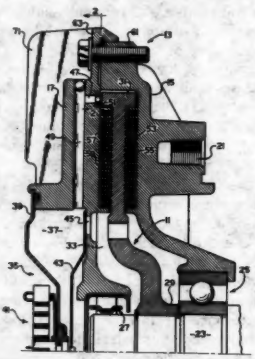
FLUID COUPLING DEVICE WITH IMPROVED FLUID COOLING

Gerard M. Light, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 21, 1985, Ser. No. 789,599

Int. Cl.[4] F16D *35/00*

U.S. Cl. 192—58 B **10 Claims**



1. A fluid coupling device comprising a first rotatable coupling assembly defining an axis of rotation, enclosure means associated with said first rotatable coupling assembly to define a fluid chamber therebetween, valve means associated with said first rotatable coupling assembly and disposed to separate said fluid chamber into a fluid operating chamber and a fluid reservoir chamber, a second rotatable coupling member disposed in said fluid operating chamber and being rotatable relative to said first rotatable coupling assembiy, said valve means being operable to control the flow of fluid between said reservoir chamber and said operating chamber, characterized by:

(a) said first coupling assembly defining a cooling fluid chamber disposed radially outwardly from said fluid operating chamber, said cooling fluid chamber including an inlet opening and an outlet opening, said inlet opening and said outlet opening comprising substantially the only fluid communication between said operating chamber and said cooling fluid chamber;

(b) first fluid directing means disposed adjacent said fluid operating chamber and being operable to direct fluid through said inlet opening into said cooling fluid chamber in response to relative rotation between said first coupling assembly and said second coupling member;

(c) second fluid directing means disposed adjacent said outlet opening and being operable to direct fluid through said outlet opening into said operating chamber in response to relative rotation between said first coupling assembly and said second coupling member; and

(d) said cooling fluid chamber being configured to extend circumferentially about a substantial portion of said operating chamber, whereby a substantial amount of heat is transferred to said first coupling assembly from fluid flowing through said cooling fluid chamber.

4,627,524

VISCOUS FLUID COUPLING DEVICE

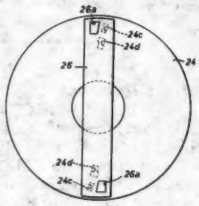
Masaharu Hayashi, and Masato Itakura, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 14, 1983, Ser. No. 542,199

Claims priority, application Japan, Oct. 22, 1982, 57-159734[U]

Int. Cl.[4] F16D *35/00*

U.S. Cl. 192—58 B **6 Claims**



1. A viscous fluid coupling device, comprising:

a housing rotatably mounted on an input shaft to store therein a predetermined amount of viscous fluid;

a rotor fixed to said input shaft and located in said housing;

a partition plate secured in said housing to subdivide the interior of said housing into an operation chamber containing therein said rotor and a portion of the viscous fluid and a reservoir chamber storing therein the remaining portion of the viscous fluid, said partition plate being provided with a first slot and a second slot spaced radially inwardly from said first slot;

a first labyrinth between said partition plate and said rotor to be supplied with the viscous fluid through said first slot from said reservoir chamber;

a second labyrinth between said rotor and the inner wall of said housing to be supplied with the viscous fluid through said second slot from said reservoir chamber;

a valve plate rotatable in said reservoir chamber to open and close said first and second slots to control the quantity of the viscous fluid supplied into said first and second labyrinths; and

thermally responsive means arranged to rotate said valve plate in response to changes in the ambient temperature of said coupling device;

wherein said valve plate is provided with a single slot to be overlapped with said first slot in said partition plate, and wherein said valve plate further comprises means for closing both said first and second slots in a first position of said valve plate with respect to said partition plate, for effecting overlapping of only said first slot and said single slot formed in said valve plate in a second position of said valve plate with respect to said partition plate, for closing both said first and second slots in a third position of said valve plate with respect to said partition plate, and for opening both said first and second slots in a fourth position of said valve plate with respect to said partition.

4,627,525

ELECTROMAGNETIC CLUTCH FOR A DRIVE ASSEMBLY OF A MOTOR VEHICLE

Selcuk Geldec, Talheim, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1984, Ser. No. 632,014

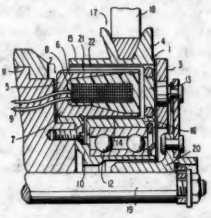
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326686

Int. Cl.[4] F16D *27/10*

U.S. Cl. 192—84 C **8 Claims**

1. Electromagnetic clutch for a motor vehicle drive assembly to produce a rotational connection between a rotational

drive element and a shaft of the assembly, having a stationary excitation device, and having an armature connected rotationally fixed to the shaft, which armature becomes coupled to the rotational drive element when the excitation device is activated, the excitation device comprising an annular disc-shaped yoke with two ring flanges concentrically arranged, extending substantially at right angles to the yoke and accommodating a coil, the rotational drive element comprising an annular disc with a first partition ring surrounding said excitation device concentrically with a small air gap between said first partition



ring and the excitation device, and a second partition ring concentrically disposed within said excitation device with a small air gap therebetween, the excitation device and the rotational drive element of the electromagnetic clutch being configured to function also as a pulse generator, both one ring flange on a periphery thereof and one partition ring on a periphery opposite to the said one ring flange having tooth-type protrusions and recesses of substantially the same number and distribution disposed in an axial direction for generating from said excitation device pulses having a frequency proportional to the rotational speed of the drive element.

4,627,526

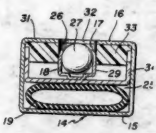
CONVEYOR SYSTEM WITH ROLLERS AND PLUNGERS

Camillo Masciarelli, 415 Berlin Rd., Marlboro, Mass. 01752

Filed Jul. 15, 1985, Ser. No. 755,065

Int. Cl.[4] B65G *13/075, 13/10*

U.S. Cl. 193—35 A **3 Claims**



2. Conveyor system, comprising:

(a) a frame on which is mounted a series of rollers for supporting and driving an article along the frame, the rollers being arranged in spaced, parallel relationship with a space between each adjacent pair of rollers,

(b) a conveyor element located in one of the said spaces, the element consisting of a main body having an upper surface located below the level of the tops of the rollers, the main body having a series of bores in which plungers are slidably carried, the plungers being provided with ball-type anti-friction members, and

(c) a pneumatic bladder located in the main body to move the plungers from a first position below the said level of the rollers to a second position above the said level, wherein several conveyor elements are provided in a closely-related group to form a table,

wherein the main body includes a tube with a rectangular cross-section and with a flat upper wall having the said upper surface and formed with circular apertures defining part of the said bores, and wherein the main body includes a polymer slab located within the tube and formed with the remainder of the said bores, wherein a pressure plate lies between the bladder and the slab, and wherein coil springs are located between the pressure plate and the slab to continuously press the slab against the upper wall of the main body during both inflated and the non-inflated conditions of the bladder.

4,627,527

BALUSTRADE FOR PASSENGER CONVEYOR

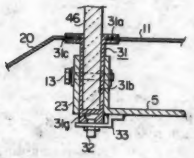
Chuichi Saito, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 437,307, Oct. 28, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 670,889

Claims priority, application Japan, Oct. 30, 1981, 56-172743; Apr. 28, 1982, 57-70477

Int. Cl.[4] B66B *23/22*

U.S. Cl. 198—335 **3 Claims**



1. A balustrade for passenger conveyor, the balustrade comprising:

a glass panel located beneath a movable endless handrail;

an inner deck cover and an outer deck cover respectively located inside and outside a lower portion of said glass panel;

a packing mounted between said glass panel and said inner and outer deck cover;

a support bed for supporting said glass panel;

said packing being of a unitary structure formed of a hard material and including a groove for receiving a lower end portion of the glass panel without forming a gap therebetween and grooves formed in an upper portion of said packing at both sides of the latter for respectively receiving end portions of the inner and outer deck covers, said packing being disposed so that one side surface thereof is in contact with the support bed and being threadably secured at a lower end thereof to a main body frame or a support member;

a pressing plate disposed on an opposite side surface of the packing and being in contact therewith; and

bolt means extending through said pressing plate, said packing and said glass panel for securing the pressing plate, packing and glass panel to said support bed so as to provide a stable support of the glass panel whereby the glass panel is prevented from being displaced in an upward and downward direction.

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CONVEYING SYSTEM FOR MULTIPLE DIE PRESSES OR PRESS LINES

Gerald Mikusch; Wolfgang Hübner, and Werner Münch, all of Göppingen, Fed. Rep. of Germany, assignors to L. Schuler GmbH, Göppingen, Fed. Rep. of Germany

Filed Aug. 8, 1983, Ser. No. 521,370

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1982, 3229943

Int. Cl.[4] B65G *25/00*

U.S. Cl. 198—621 **10 Claims**

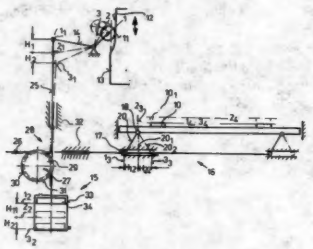
1. A conveying system for one of a multiple-die press and a press lien having gripper rail means extending in the conveying

direction of the work pieces and carrying gripper devices that interact for gripping the work pieces, with said gripper rail means being responsive to interruptable driving movements led off the drive of the press for the lifting and lowering movement of the gripper rail means, comprising

a press-driven cam means having cam parts for positioning the gripper rail means to a highest position and a lowest position,

a control pulley on a deflecting lever for interacting with the cam means,

a regulating means operable into positions corresponding to



the highest and the lowest position of the gripper rail means and also into a position that lifts the control pulley off the cam means, and

a lever means having a joint coupling point and coupled to the control pulley and the regulating means and having a pickup point coupled at the gripper rail means, positionable between a first end position to place the gripper rail means in its lowest position, and a second central position to place the gripper rail means in its highest position, and a third position to place the gripper rail means below the highest position for admitting removal of said gripper devices.

4,627,529

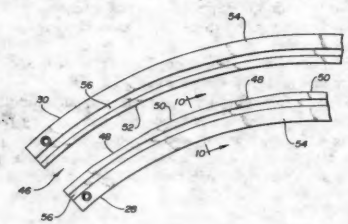
SPIRAL CONVEYOR

Curtis S. Tarlton, Florham Park, and Richard A. Ford, Blackwood, both of N.J., assignors to C. & T. Tarlton, Inc., Union, N.J.

Filed Apr. 22, 1985, Ser. No. 725,387

Int. Cl.[4] B65G *21/18, 21/20*

U.S. Cl. 198—778 **13 Claims**



1. A conveyor assembly comprising a central tubular member having a longitudinal axis, track means mounted on said tubular member spaced outwardly therefrom and defining a generally helical path about said member having an infeed end and an outfeed end, said track means comprising a pair of parallel tracks for supporting endless conveyor means between said infeed and outfeed ends, said track means including a multi-sided polygonal construction and arrangement comprising a plurality of curved surfaces and a plurality of flat straight surfaces for reducing frictional contact with respect to said conveyor means whereby the capstan effect of said conveyor means relative to said track means is substantially overcome, an inner one of said tracks adjacent said member having an inner surface extending in the direction of said longitudinal axis facing a corresponding surface of an outer one of said tracks, said inner surface comprising a substantially multisided polygonal construction for each 360° about said central member including said plurality of flat straight surfaces which extend in the direction of said conveying path arranged in helical fashion about said frame for reducing frictional contact with said conveyor means and overcomming the capstan effect of said conveyor means relative to said inner track, said outer one of said tracks comprising a smooth continuous curved surface, drive means including a primary drive located at one of said infeed and outfeed ends, power means mounted for supplying power to said primary drive, said primary drive operably engaging said endless conveyor means for being driven at said one end in a first direction comprising a conveying path, said conveyor means having an endless return path opposite in direction and corresponding to said conveying path.

4,627,530

ELEVATING CHAIN CONVEYOR

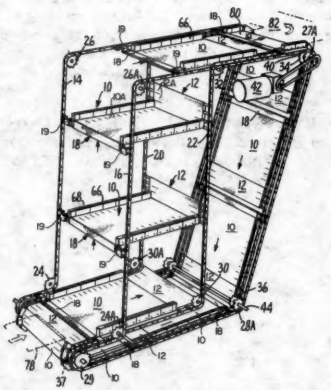
Walter Franke, Fremont, Calif., assignor to Universal Conveyor Co., Inc., Fremont, Calif.

Continuation of Ser. No. 543,854, Oct. 20, 1983, abandoned.

This application Jun. 24, 1985, Ser. No. 748,057

Int. Cl.[4] B65G *17/16*

U.S. Cl. 198—799 **8 Claims**



1. A conveyor for moving articles from one level to another as well as in a horizontal path, comprising, in combination:

first and second pairs of endless chains arranged on a plurality of sprockets around a path including horizontal and vertical runs, with one of each pair of chains being on one side of said path and the other of each pair being on the opposite side of said path,

plural spaced-apart pluralities of contiguous support members extending from one side of the path to the other, each plurality of contiguous support members combining to form a substantially continuous-surface articulated carrier which is rigid to support a load when the carrier is supported from its ends,

first support means extending from one side of the path to the other for supporting a respective first end of each of said continuous-surface carriers, the opposite ends of each said first support means being each connected to a respective one of said first pair of endless chains,

at least one separator element having a substantially continu-

ous surface extending across said path with opposite ends thereof being supported by said first pair of chains to form an articulated separator having a substantially continuous surface and being substantially contiguous with the said first end of each respective carrier, and

second support means extending from one side of the path to the other for supporting a respective second end of each of said continuous-surface articulated carriers, the opposite ends of each said second support means being each connected to a respective one of said second pair of endless chains, said second support means extending across said path and being substantially contiguous with the said second end of the respective carrier,

adjacent ones of said plural spaced-apart continuous-surface carriers being substantially coplanar with each other and with the respective separator and second support means therefor when the chains on each side of said path lie adjacent one another, and the space between each adjacent pair of said spaced-apart coplanar carriers being substantially filled with a respective pair of said separator elements and second support means, the contiguous substantially continuous surfaces of all said carriers, separators and support means thus providing a substantially continuous surface when said chains lie adjacent one another,

whereby articles transported by said spaced-apart carriers cannot fall therebetween, said separators and said second support means serving to provide with said carrier means a substantially continuous surface when the respective chains lie adjacent one another, said separators also serving as an abutment when the chains are separate from each other and the carriers are one above another.

4,627,531

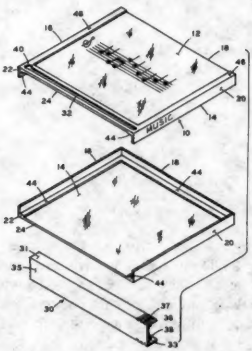
RECORDING DISK ENCLOSURE

Philip M. Clemens, 2424 Forest Park Blvd., Fort Wayne, Ind. 46805

Continuation-in-part of Ser. No. 709,399, Mar. 7, 1985. This application Apr. 24, 1985, Ser. No. 726,790

Int. Cl.[4] B65D *85/57*

U.S. Cl. 206—309 **16 Claims**



1. A recording disc enclosure, which comprises:

(a) a semi-rigid, generally rectangular top portion;

(b) a semi-rigid, generally rectangular bottom portion substantially the size of the top portion;

(c) four side portions adjoining said top and bottom portions about the periphery of said top and bottom portions, forming an enclosed area between said sides and said top and bottom portions, said enclosed area sized to receive a recording disc therein;

(d) an elongated aperture disposed through one of the side portions, said aperture of a size sufficient to pass a recording disc therethrough;

(e) an externally disposed top and bottom guide slot means, extending in parallel alignment substantially along the top and bottom portions of the enclosure in proximity to the aperture side;

(f) an elongated closure strip having a side sized to substantially cover the elongated aperture, the closure strip further having top and bottom confronting portions adjoining the closure strip side in spaced relation;

(g) a top and bottom guide post means, disposed upon the confronting top and bottom portions of the closure strip, the guide post means sized to align and guide the closure strip along the guide slot means from a closed position substantially covering the aperture to an intermediate extended position parallel to the aperture side; and

(h) a relieved area disposed at one end of the top and bottom guide slot means, the relieved area positioned to receive the top and bottom guide post means when the closure strip is extended to the intermediate position, the relieved area providing a means for rotation of the extended closure strip from the intermediate position to a position tangent to the closed position of the closure strip, and adjacent to the side of the enclosure adjoining the aperture side.

10. An enclosure for protecting a recording disc therein, which comprises:

(a) a semi-rigid, generally rectangular top portion having at least three depending sides;

(b) a semi-rigid, generally rectangular bottom portion sized to align with the depending sides of the top portion;

(c) a means to secure the top and bottom portions in spaced relation to form an enclosed space of a size sufficient to receive a recording disc therebetween;

(d) an aperture disposed through one side of the enclosure, the aperture sized to receive a recording disc therethrough;

(e) an externally disposed top and bottom guide slot means, extending in parallel alignment substantially along the top and bottom portions of the enclosure in proximity to the aperture side;

(f) an elongated closure strip having a closure side with adjoining top and bottom confronting sides, the closure strip sized to extend substantially the length of the aperture in a closed position, with confronting top and bottom sides of the closure strip closely received about the guide slot means;

(g) a top and bottom guide post means, disposed upon the confronting top and bottom sides of the closure strip, the guide post means positioned to align and guide the closure strip along the top and bottom guide slot means;

wherein the closure strip may be manually biased from the closed position to an intermediate extended position in parallel alignment with the closed position, and subsequently rotated from the intermediate extended position to a position adjacent to the side adjoining the aperture side and tangent to the closed position of the closure strip.

4,627,532

DIGITAL AUDIO DISK ENCLOSURE

Philip M. Clemens, 2424 Forest Park Blvd., Fort Wayne, Ind. 46805

Filed Mar. 7, 1985, Ser. No. 709,399

Int. Cl.[4] B65D *85/57*

U.S. Cl. 206—309 **20 Claims**

1. An enclosure for protecting a digital audio disk, which comprises:

(a) a semi-rigid, generally rectangular top portion with four depending sides;

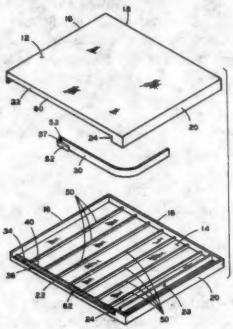
(b) a generally rectangular bottom portion with four depending sides sized to align with the four depending sides of said top portion;

(c) a means to secure said top portion to said bottom portion

to form an enclosed area sized to receive a digital audio disk therebetween;

(d) a first relief extending through one of said depending sides of said top portion, and a second relief extending through one of said depending sides of said bottom portion, said first and second reliefs aligned to form an elongated aperature through one said side when said sides are secured by said means to secure said four depending sides; said aperature sized to receive a digital audio disk therethrough;

(e) a guide means disposed upon said bottom portion in spaced parallel alignment substantially along said aperature side and substantially along one adjoining side, said guide means disposed upon said bottom portion in space[d]



alignment with a guide means disposed upon said top portion, when said top and bottom portions are secured together in a manner to form a contiguous aligned guide means within said enclosure;

(g) a flexible closure strip sized to be slidably received within said aligned guide means, said closure strip of a length and width sufficient to enclose said aperature;

(h) a tab means disposed near one end of said closure strip, said tab means disposed upon said closure strip externally of said enclosed area to provide means to manually bias said tab means between open and closed positions within said aperature, said open position exposing an opening through said aperature sufficient to pass a digital audio disk therethrough.

4,627,533

CERAMIC PACKAGE FOR COMPENSATED CRYSTAL OSCILLATOR

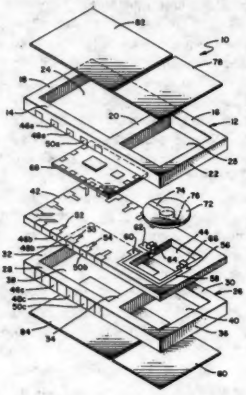
Gary B. Pollard, Santa Ana, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 29, 1984, Ser. No. 665,594
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—328 **16 Claims**

1. A ceramic package comprising:

an upper body, a center body and a lower body, said bodies being made of vitrified ceramic and joined together by vitrified ceramic;

first and second openings in said upper body, first and second openings in said lower body and an opening in said center plate, said second openings in said upper and lower bodies being in communication with said opening in said center plate to define an oscillator crystal cavity, said first openings in said upper body and said lower body being out of communication with each other and out of communication with said oscillator crystal cavity to define an oscillator network cavity and a compensation network cavity; and



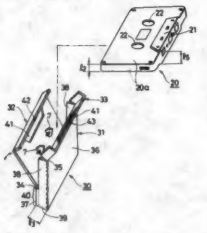
cover means over each of said cavities to form separate closed oscillator crystal, oscillator network and compensation network cavities.

4,627,534

MAGNETIC TAPE CASSETTE STORAGE CASE

Choji Komiyama, and Osamu Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 5, 1985, Ser. No. 720,250
Claims priority, application Japan, Apr. 6, 1984, 59-50298
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—387 **2 Claims**



1. A magnetic tape cassette storage case, comprising:

a casing having a pocket into which a rear half of a magnetic tape cassette may be inserted, and a wide wall formed by extending one wall of said pocket in such a manner that said one wall will confront one of a front and rear surface of said magnetic tape cassette;

a first cover having a pair of rotation preventing protrusions insertable into reel shaft insertion holes of said magnetic tape cassette and a recess for receiving a thicker portion of said magnetic tape cassette, said first cover being swingably connected through a hinge to said pocket;

a second cover having another recess for receiving said cassette's thicker portion, said second cover being swingably connected through a hinge to said wide wall; and

said first and second covers having locking parts which are engaged with each other to close said cassette storage case.

4,627,535

CONTAINER FOR MAGNETIC TAPE CASSETTES

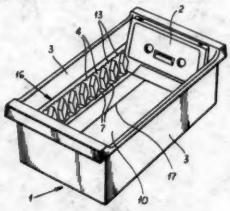
Balthasar Kirchner, and Siegfried Schleicher, both of Eferding, Austria, assignors to Ernst Stadelmann Gesellschaft m.b.H., Bahnhofstrasse, Austria

Filed Feb. 27, 1985, Ser. No. 705,989

Claims priority, application European Pat. Off., May 29, 1984, 84890097.3

Int. Cl.[4] B65D *85/672, 1/24*

U.S. Cl. 206—387 **10 Claims**



1. In a container for holding parallelepipedic articles comprising:

a bottom and side walls defining an upwardly open space,

said space being delimited at least in part by two horizontally spaced apart vertical walls rising from said bottom, and

a plurality of receptacles provided between said two vertical walls and adapted to slidably receive respective ones of said articles, each of said receptacles comprising two upwardly open horizontally spaced apart tracks extending adjacent to confronting side faces of respective ones of said vertical walls for receiving opposite edges of respective articles,

the improvement residing in that

each of said receptacles comprises laterally spaced apart supports disposed near said bottom and adapted to slidably support one of said articles received in the respective receptacle, each of said tracks of each of said receptacles has above the respective supports a pair of formations projecting toward one another and defining a respective throat engageable with a respective one of said articles in said receptacle on each side of said article,

said throat of each of said receptacles are horizontally aligned so that one of said articles which is contained in one of said receptacles and has a thickness that is slightly smaller than the width of each of said throats is tiltable in said receptacle about fulcrums formed by said tracks at said throats, and

said tracks of each of said receptacles are provided with stops for limiting the tilting movement of such article in said receptacle,

each of said tracks having horizontally spaced apart guiding surfaces, which diverge symmetrically from said throat in upward and downward directions.

4,627,536

MODULAR DISPLAY PACKAGE

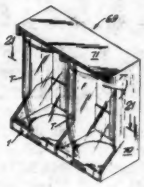
Richard E. Pugh, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 639,902, Aug. 13, 1984, abandoned. This application Aug. 26, 1985, Ser. No. 769,248

Int. Cl.[4] B65D *85/44*

U.S. Cl. 206—426 **1 Claim**

1. The combination of a modular display package for individual articles having rear, top, bottom and side wall assemblies and an article interposed between said rear, top, bottom and side wall assemblies with each of said side wall assemblies having a cutout portion extending inwardly toward said rear wall assembly, and a package sleeve for packaging a plurality of said modular display packages with portions of the individual articles exposed for inspection comprising a package blank having a top panel, a bottom panel, and a pair of side panels, package engaging lock means on said said panels, and one free edge of one side panel being fastened to a free edge of said top or bottom panel to form said package sleeve, said package engaging lock means comprising a foldable retaining tab on each of said side walls, each of said side walls having a cutout and said foldable retaining tabs being hingedly attached to and



extending from the cutouts in said side walls, said retaining tabs cooperating with and foldable around the cutouts in the side wall panels of the modular display packages to hold the modular display packages securely in place said plurality of modular display packages comprises a pair of modular display packages positioned in side-by-side position, so that one sleeve retaining tab is foldable around a cutout in one modular display package side wall and another sleeve retaining tab is foldable around a cutout in another modular display package.

4,627,537

LID FOR DRINKS CONTAINER

John D. Rogers, Ontario, Canada, assignor to Amhil Enterprises Ltd., Mississauga, Canada

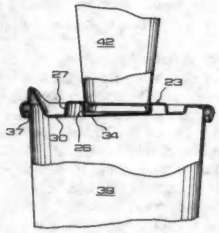
Filed Jul. 12, 1985, Ser. No. 754,163

Claims priority, application United Kingdom, Nov. 19, 1984, 8429214

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.[4] B65D *21/02, 41/26*

U.S. Cl. 206—501 **16 Claims**



1. A circular lid for a container of liquids, which lid is vacuum formed in thin extruded sheet plastic; wherein

the lid includes a depressed well, which is surrounded by a raised ridge which is in turn surrounded by a depressed trough, which is in turn surrounded by a rim, each of said well, ridge, trough and rim being substantially circular;

the bottom of the well and the top of the ridge each being flat;

the side walls and top of the ridge being of such height and radial width that a person's thumb and forefinger can be easily placed well in contact with the respective side walls, one inside and one outside the ridge;

the plane of the bottom of the well being at a small angle to the plane of the top of the ridge, such that the height of the side walls of the ridge varies around the circumference of the ridge;

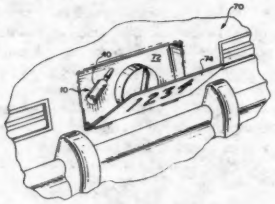
there being a cut or slit in the trough outside the ridge;
the orientation at which said walls are the highest with respect to the bottom of the well being substantially coincident with the orientation at which the said cut is formed;
said cut or slit being so placed that when a finger and thumb are in place on either side of said ridge, one of said finger and thumb, upon squeezing the ridge, enters the cut or slit and thereby tends to spread the cut or slit so that liquid may be poured therethrough; and
said cut or slit being out of line with the axis of extrusion or grain of the extruded sheet.

4,627,538

VESSEL CLOSURES AND METHOD OF FORMING THE CLOSURES

Nick H. Kafkis, 8537 Skokie Blvd., Skokie, Ill. 60077

Filed Mar. 25, 1985, Ser. No. 715,920
Int. Cl.[4] B65D *27/12, 85/00*
U.S. Cl. 206—524.1 **18 Claims**



1. An improved vessel closure for a vessel having an elongate filling/dispensing tube with an open end, said vessel having a liquid therein, said improvement comprising:
the open end of said tube having a closed end, said closed end formed by a portion of the tube heat sealed to itself;
said tube further including means for reusably sealing said open end which can be utilized to reseal said tube after use; and
adhesive means secured to said vessel for affixing said vessel to a convenient surface, wherein said vessel includes a lock deicing liquid therein and said vessel is affixed to a surface on the outside of an automobile by said adhesive means.

7. A method of sealing and mounting a vessel, comprising:
providing a vessel having an elongate filling/dispensing tube with an open end, said vessel having a liquid therein;
closing the open end of said tube by sealing said open end, including reusably sealing said open end by folding said open end of said tube back against said tube and securing said folded over open end to said tube; and
securing adhesive means to said vessel to affix said vessel to a convenient surface, including securing said folded over open end to said tube by placing a tube of heat shrinkable material over at least said open end and said tube and heat shrinking said material to form said seal.

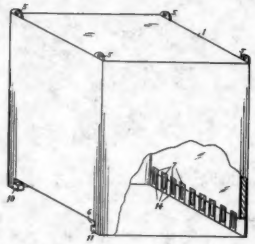
4,627,539

METHOD OF AND APPARATUS FOR TRANSPORTING GOODS

Wei-Chuan Chang, 49 Tung-An Lane, Lao-Pi Village, Nei-Pu Hsiang, Ping Tung Hsien, and Yang Yin-Lung, 24-4 Lane 51, Yung Nien Street, Kaohsiung, both of Taiwan

Filed Apr. 24, 1984, Ser. No. 603,353
Int. Cl.[4] B65D *19/00*
U.S. Cl. 206—597 **2 Claims**

1. An apparatus for loading and shipping a consignment of goods, said apparatus comprises a bottomless container case, a removable railing bottom plate and, a pallet, said bottomless container case having bottom opening wide opened to each side wall of the container case, said pallet comprising a base plate in the same size as the bottom opening of the container case plus the thickness of the side walls, a number of railing bars being fixedly arranged in parallel and equal apart on said base plate occupying a size little smaller than the bottom opening, so that said railing bars can project into the bottom opening of the container case when the latter is put to cover the pallet, a slot and certain number of hook rings or sockets which serve as automatic connections means for the railing bottom plate are formed at lower edges of the front and rear side walls of the container case respectively, the railing bottom plate comprising a same number of railing bars minus 1 as the pallet and are arranged in parallel and equal apart, they have a common lateral bar formed at their forward ends, on the other end



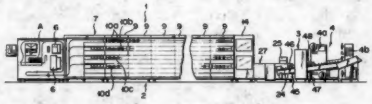
of them having notches formed thereon for the automatic connection means, each railing bar of the railing bottom plate is made smaller in width and height than the space between the paralleled railing bars and the height of the railing bars of pallet respectively, but are longer in length in order that when the railing bottom plate is to be inserted into the container case through said slot and the interval gaps of the railing bars of the pallet, they are long enough to reach into the hook rings or sockets for the automatic connection, thus when the container case is lifted to transport, both ends of the railing bars of the bottom plate may be lifted up by said automatic connections like a sedan chair and transferring the consignment from the pallet onto the railing bottom plate.

4,627,540

AUTOMATIC MAIL PROCESSING APPARATUS

Kazuo Takeda, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 23, 1983, Ser. No. 496,989
Claims priority, application Japan, May 29, 1982, 57-91688; May 29, 1982, 57-91689
Int. Cl.[4] B07C *5/10*
U.S. Cl. 209—555 **5 Claims**



1. An automatic mail processing apparatus comprising:
reading and sorting means for (i) reading out mail sorting data, (ii) forming mail stacks in accordance with said sorting data, and (iii) automatically and successively removing the mail stacks;
convey means for transporting, along one direction, a stack of mail removed from said reading and sorting means;
labeling means, provided on said convey means downstream of the reading and sorting means along said one direction, for attaching a label bearing the corresponding sorting

data to a stack of mail transported by said convey means from said reading and sorting means;

bundling means provided on said convey means downstream of said labeling means, for bundling a mail stack having said label attached thereto by said labeling means;

detection means disposed between said labeling means and said bundling means for detecting a thickness of a mail stack transported by said convey means; and

mail reject means disposed between said detection means and bundling means and including (a) a reject member movable between a first inoperative position relative to said convey means and a second operative position relative to said convey means, and (b) actuation means for normally holding said reject member in first inoperative position and for moving said reject member from said first inoperative position to said second operative position to thereby remove said mail stack from said convey means in response to said detection means detecting a thickness of said mail stack less than a predetermined thickness which is sufficient to prevent damage by said bundling means;

said detection means including a light source and light receptor means for receiving light from said light source, said light source and said light receptor means establishing therebetween a light path which tranverse said convey means, and

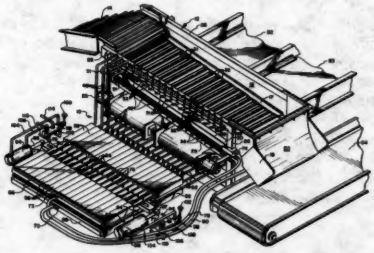
wherein said light source and said light receptor means are placed at a height corresponding to said predetermined thickness of a mail stack whose rigidness inhibits the bundling action from damaging the mail stack.

4,627,541

APPARATUS AND METHOD FOR SORTING PRODUCE

Lynn F. Johnson, American Falls, Id., assignor to Double L Manufacturing, American Falls, Id.

Filed Jan. 4, 1985, Ser. No. 688,744
Int. Cl.[4] B07B *1/14*
U.S. Cl. 209—668 **47 Claims**



1. An apparatus for sorting products according to size comprising:

a roller conveyor for transporting products placed on said roller conveyor from one end thereof to the other, said roller conveyor comprising a plurality of rollers; and

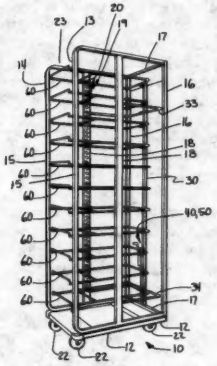
individual hydraulic means associated with each said roller for hydraulically controlling the position of each said roller so as to individually control the spacing between each pair of adjacent rollers such that the spacing between pairs of adjacent rollers is selectively adjustable in one of a plurality of modes, the modes comprising (a) adjusting all of the rollers at once by a uniform amount, (b) adjusting all of the rollers at once by uniformly increasing or decreasing the spacing between adjacent rollers from one end to the other, and (c) adjusting the spacing between one pair of rollers independently of the spacing between any other pair of rollers, whereby products of a selected size and smaller will drop through the spaces between said rollers while larger products will be transported to the end of said roller conveyor.

4,627,542

DISPLAY APPARATUS HAVING A MECHANISM FOR TILTING SHELVES

Howard J. Fredrickson, Cannon Valley Township, Goodhue County, Minn., assignor to Cornelius Cannon, Inc., Cannon Falls, Minn.

Filed Mar. 18, 1983, Ser. No. 476,751
Int. Cl.[4] A47F *5/13*
U.S. Cl. 211—150 **29 Claims**



1. A combination transport and display cart having multiple bi-stable shelves which are easily moved from a stable horizontal transport position to a stable inclined display position, comprising:

a. an upright frame having opposed sides;

b. pivot means in each side for pivotal support of a plurality of shelves;

c. a plurality of shelves mounted in the frame, said shelves being substantially parallel to each other and being one above the other, each shelf being individually pivotally mounted in the pivot means and having a rotator lever spaced from the shelf's respective axis of rotation;

d. a shelf tilt column connected to said shelf rotator levers, said column being vertically and fore-aft movable with said levers through an arcuate path as the shelves remain parallel to each other and pivotally rotate either from the horizontal to the inclined position or from the inclined to the horizontal position;

e. vertically extendible tilt means connecting the column to the frame for vertically moving the column with respect to the frame, for pivoting the shelves between the positions; and

f. a first hinge on the frame and connecting the tilt means directly to the frame, and a second hinge on the column and connecting the tilt means directly to the column.

4,627,543

COMPRESSION SLEEVE CORNER STRUCTURE FOR ADJUSTABLE SHELVING

Charles W. Nicely, Dallas Township, Luzerne County, Pa., assignor to United Steel & Wire Company, Battle Creek, Mich.

Filed Jun. 25, 1985, Ser. No. 748,548
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—187 **5 Claims**

1. In a shelving unit having a plurality of upright posts, at least one shelf, and a corner structure coacting between said shelf and each said post for stationarily securing said shelf to said posts at a selected location, comprising the improvement wherein:

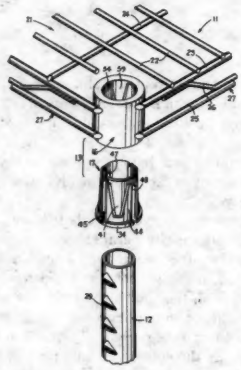
said corner structure includes first and second separable

clamping members for clampingly connecting a corner of the shelf to one of the posts;

said first clamping member comprising a one-piece compression sleeve constructed of a synthetic material and having a bore of substantially uniform diameter extending therethrough for accommodating the post therein, said compression sleeve having a projection which projects radially inwardly of said bore for engagement with a dimple provided in the respective post;

said compression sleeve including a plurality of angularly spaced and axially projecting recesses formed therein and extending axially downwardly from the upper end thereof, said recesses having a width as measured in the circumferential direction of the sleeve which is of a converging tapered cross section as the recess projects axially downwardly, said recesses opening through only a portion of the wall thickness of the compression sleeve so that the recesses open outwardly through the outer annular wall of the sleeve, said recesses having a back wall thereof defined by a surface of generally cylindrical configuration;

said compression sleeve also having a plurality of narrow but axially elongated slots formed therein and extending radially through the sidewall thereof, said plurality of slots including a first slot which is disposed midway between an angularly adjacent pair of said recesses and opens axially



upwardly from the lower end of said compression sleeve, said first slot extending through a majority of the axial length of said sleeve but terminating short of the upper end thereof, said plurality of slots including a second axially elongated slot which is also disposed midway between an angularly adjacent pair of said recesses and opens axially downwardly from the upper end of said sleeve, said second slot extending over a majority of the axial length of said sleeve but terminating short of the lower end thereof;

said second clamping member comprising a one-piece rigid collar constructed as a non-split sleeve member, said collar being fixed to said shelf adjacent a corner thereof so that said collar defines a substantially cylindrical bore which extends coaxially and vertically therethrough;

said collar including a plurality of angularly spaced wedgelike parts which project axially upwardly from the lower end thereof, said wedgelike parts being of a diverging cross section in the peripheral direction of the collar as they project axially upwardly; and

said collar being axially telescoped downwardly over said compression sleeve with said wedgelike parts being wedging received into the recesses of the compression sleeve to effect circumferential compression of the sleeve and radial inward deformation thereof into snug gripping engagement with the post.

4,627,544

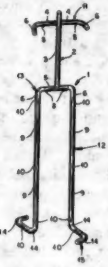
CLOTHES HANGER ASSEMBLY

Afra Scarpa, and Tobia Scarpa, both of Trevignano, Italy, assignors to Centro Studi e Servizi Moda di Paola Bertagnin E C. S.A.S., Treviso, Italy

Filed Jan. 16, 1985, Ser. No. 692,034

Int. Cl.[4] A47F 5/00

U.S. Cl. 211—189 10 Claims



1. A clothes hanger assembly comprising a plurality of modular elements provided with accessary holders for the display of garments, said modular elements being adapted to be joined to one another to form a plurality of displays in different shapes and sizes, at least one of said modular elements being formed as a mannequin, said modular elements being formed of tubular components adapted to be engageable with one another, each of said tubular components including straight tubes of different lengths and tubes bent at 90°, said tubular components being engageable with one another by the interposition between at least some of said tubular components of a clamping member, said clamping member comprising:

a sleeve having the same diameter as said tubular components;

a pair of superposed plates disposed in said sleeve and having extremities protruding therefrom for insertion into the ends of the tubular components to be joined, one of said plates being formed with a threaded bore centrally thereof; and

a set screw threaded into said bore through an opening formed in the wall of said sleeve, said set screw bearing on the other of said plates for driving said superposed plates apart, whereby said tubular components to be joined are engaged and clamped.

4,627,545

CAR COUPLER WITH ENLARGED GATHERING ZONE

Donald L. Herbert, Lexington; Lynn A. Schneider, and Zoltan Kovacs, both of Mansfield, all of Ohio, assignors to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jun. 14, 1984, Ser. No. 620,486

Int. Cl.[4] B61G 3/00

U.S. Cl. 213—100 R 12 Claims

1. A car coupling head with an enlarged gathering zone matable with a substantially identical head on another car comprising the combination of

a housing having a generally rectangular front plate with a generally flat face and upper and lower horizontal edges;

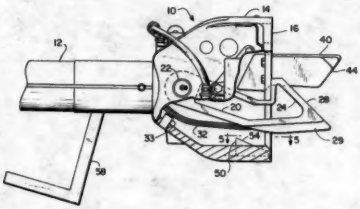
means defining a generally rectangular pocket opening through said front plate, the longer dimension of said pocket opening being horizontal;

a hook pivotally mounted in said housing for movement about a vertical axis,

said hook extending through said pocket opening and having a portion protruding beyond said front face with a majority of the protruding portion lying to one side of the longitudinal center line of said head;

a guide member protruding from a first corner of said front plate and means defining a guide hole in a second corner of said front plate to receive the guide member of a mating head, said first and second corners being on substantially the same horizontal line;

a guide horn mounted near one of said horizontal edges of said front plate and protruding from the face thereof, said guide horn having an inwardly facing surface vertically offset from the closest surface of said hook, said horn being laterally offset from said longitudinal centerline to the other side from said hook;



means defining an opening adjacent said horn for receiving the horn of a mating head; and

a guide wedge mounted in said housing adjacent an edge of said opening for engaging the horn of a mating head to align the respective flat faces of the heads in parallel relationship,

said horn including a portion extending into said housing having a curved surface protruding laterally toward said wedge.

4,627,546

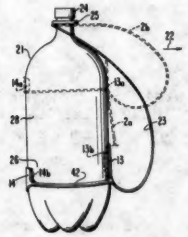
FLEXIBLE DETACHABLE HANDLE AND CARRIER FOR A PLASTIC BOTTLE AND THE COMBINATION THEREOF

Jose R. Carranza, San Francisco, Calif., assignor to Merrick Industries, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 425,353, Sep. 28, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 579,243

Int. Cl.[4] B65D *23/10*

U.S. Cl. 215—100 A **4 Claims**



1. Structure for use in carrying and pouring from a plastic bottle having a narrowed neck and a cylindrical bottle bottom of greater diameter than said neck, comprising an integral two-ended piece of flat flexible material comprising:

means at one end thereof for attachment to a bottle neck;

means at the other end thereof for attachment to a bottle bottom; and

means, between said one end and said other end, for providing a hand hold thereby to enable a user to carry or pour from any bottle attached to said structure,

wherein said means for attachment to said bottle bottom comprises a flexible and twistable ring having an inner diameter larger than the outer diameter of the bottle bottom to which it is to be attached and adapted to be fitted around the circumference of a lower portion of a bottle below the bottle neck in a bottle-holding mode; and

in which said flexible ring is circular and has a pair of stabilizing tabs each extending inwardly for different lengths at opposed diametrical positions of said ring, in-line with said hand hold means and said bottle neck attachment means, said ring and said tabs in bottle-mounted position being twisted from said in-line position to surround said bottle bottom and to extend parallel to vertical sides of said bottle bottom, respectively.

4,627,547

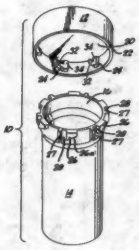
CHILD RESISTANT PACKAGE

Carl W. Cooke, 5106 Perry Park Rd., Sedalia, Colo. 80135

Filed Jan. 3, 1986, Ser. No. 816,009

Int. Cl.[4] B65D *55/02*

U.S. Cl. 215—222 **7 Claims**



1. A child resistant package comprising an open-mouthed container and a closure therefor including a top wall and depending skirt portion for receiving and sealing the mouth of said container, resilient means to urge said closure axially away from said container as said closure is drawn into the sealing position over the mouth of said container and cooperating sets of locking elements disposed on the inner surface of the depending skirt portion of said closure and rimming the open mouth of said container, the invention comprising:

one set of said locking elements comprising latch members defining a retaining portion and a stop element and said other set comprising pairs of spaced apart projections defining an openended, through-running channel therebetween for receiving the stop element of a corresponding latch member, the projections providing a positive stop for the stop element to prevent removal of said closure by mere turning, one of the projections engaging the retaining portion of the corresponding latch member to retain said closure in opposition to the urging of the resilient member, there being required the combination of an axially downward force on and a turning of said closure with respect to said container to remove said closure from the sealed and locked position on said container, and in the event said projections are damaged by shearing due to forced removal of the closure and the like, the through-running channels permitting the latch members to be positioned in the channel toward the mouth of said container with the stop element thereof of contiguity with undamaged portions of the projections to retain the locking action between the cooperating sets of locking elements.

4,627,548

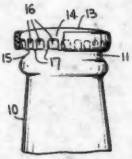
SAFEGUARD FOR SERRATED TWIST-OFF BOTTLE CAP

Kenneth H. Thompson, 4613 Saul Rd., Kensington, Md. 20895

Filed Apr. 26, 1985, Ser. No. 727,677

Int. Cl.[4] B65D *41/04*

U.S. Cl. 215—295 17 Claims



1. In combination:

a container having an annular open end defined in a neck portion;

a twist-off cap disposed about said open container end, said twist-off cap having a circumferential sidewall configured as an endless series of serrations in the form of radially outward protrusions alternating with recesses crimped against and in direct contact with said neck portion; and

gripping means in the form of a continuous band disposed circumferentially about said sidewall, said band having a radially inner surface projecting into said recesses and entirely covering said protrusions and recesses, said band having a sufficiently high coefficient of friction to prevent the hand of a user from slipping when turning the band and cap relative to the container end, yet being sufficiently smooth to prevent abrasions when sliding along a user's hand.

4,627,549

BULK CARGO CONTAINERS

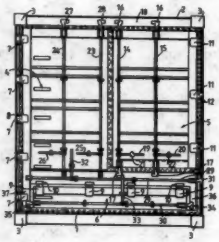
Sheron L. Dudding, Brough, England, assignor to International Ferry Freight Limited, England

Filed Mar. 21, 1986, Ser. No. 842,299

Claims priority, application United Kingdom, Mar. 28, 1985, 8508132

Int. Cl.[4] B65D *7/26*

U.S. Cl. 220—1.5 6 Claims



1. A freight container for bulk and non-bulk cargoes comprising a substantially rectangular hollow box-like structure having at least one opening therein through which a cargo in bulk form may be loaded, two main doors (4,5) at one end of the container through which non-bulk cargo may be loaded and unloaded and a substantially full width bulk discharge hatch (6) incorporated in one of the two main doors (4,5) through which bulk cargo may be unloaded.

4,627,550

CONTAINER WITH TAMPER-EVIDENT LID

Keith W. Dines, Grays, England, assignor to Dines Plastics Limited, Essex, England

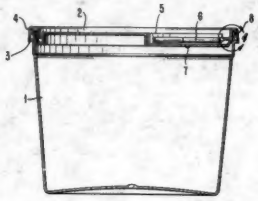
Continuation of Ser. No. 550,587, Nov. 10, 1983, abandoned.

This application Aug. 12, 1985, Ser. No. 764,773

Claims priority, application United Kingdom, Nov. 12, 1982, 8232326

Int. Cl.[4] B65D *41/16, 41/18*

U.S. Cl. 220—306 10 Claims



1. A tamper-evident lid for a container, the lid being molded as a one piece structure from plastic material and having, as integral parts thereof, a closure element, a securing arm and a release element having a tamper evident facility, the securing element being so arranged that the lid is removable only by using the release element to pull the lid from the container, wherein the closure element includes a recess defined on an upper surface thereof, the recess having an inner peripheral wall, the integral release element being secured in an inactive or stowed position in the recess by integrally molded frangible means so that the integral release element is surrounded by said inner peripheral wall and is located in the recess below the level of the upper surface of the closure element, the frangible means being of such a strength, in relation to that of the securing element, that pulling the release element sufficiently hard so as to pull the lid from the container will cause the release element to move out of the recess into an active position, and in so doing break off the frangible means thus providing a tamper evident facility, the release element then being usable to release the securing means and pull the lid from the container, the upper surface of the lid being unbroken by movement of the release element to the active position whereby the lid, once the frangible means have been broken, is reusable as a sealing lid for the container.

4,627,551

DISPENSER SYSTEM AND METHOD FOR DISPENSING PUTTY-LIKE MATERIAL

Raun A. Kopp, Brunswick, Ohio, assignor to Oatey Co., Cleveland, Ohio

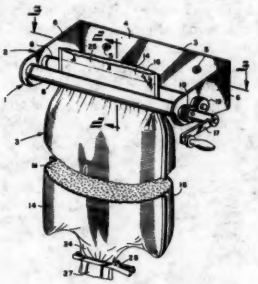
Filed Mar. 5, 1984, Ser. No. 586,118

Int. Cl.[4] B65D *35/28*

U.S. Cl. 222—1 7 Claims

1. A dispenser system for dispensing putty-like material comprising flexible bag-like container means of a size for holding at least approximately two gallons of putty-like material, and a pair of squeeze roller means for squeezing the putty-like material from said container means, said container means being made from two flat plastic sheets placed one on top of the other to form opposed flat sides which are heat sealed along the side edges, top and bottom, said bottom being heat sealed to form a funnel shape spout, the lowermost heat sealed edge of said funnel shape spout being cut off to provide a discharge opening at the bottom of said spout for discharging the material from said container means as said container means is pulled upwardly between said roller means, a hand crank attached to one of said roller means for turning one of said roller means, ratchet-less gear means between said roller means for driving the other of said roller means in unison with said one roller

means but in the opposite direction in response to turning movement of said one roller means in one direction, said roller means having rubber-like cover means thereon having a Shore A Durometer hardness of 45±5 which are compressed against each other approximately 0.050 inch each for frictionally gripping opposite sides of said container means when said container means is inserted therebetween with sufficient force to support the entire weight of said container means when filled



with at least approximately two gallons of such putty-like material without any external force being applied to said roller means or crank, and for pulling said container means upwardly between said roller means without slippage upon turning said crank in such one direction by hand and substantially flattening out the sides of said container means to squeeze out substantially all of the putty-like material from between said sides as said sides pass upwardly between said roller means.

4,627,552

FUEL SUPPLYING APPARATUS

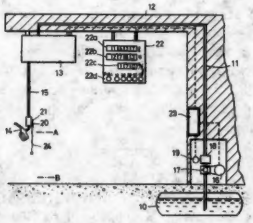
Takeomi Yoshida, Fujisawa; Kazuhisa Yamashita, Kawasaki, and Yukio Miura, Fujisawa, all of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Oct. 19, 1984, Ser. No. 663,034

Claims priority, application Japan, Oct. 20, 1983, 58-162427[U]

Int. Cl.[4] B67D *5/10*

U.S. Cl. 222—14 **6 Claims**



1. A fuel supplying apparatus comprising:

(a) a fuel supplying hose having a fuel supplying nozzle provided on a tip end thereof

(b) a pump for supplying fuel to said fuel supplying hose

(c) driving means for driving said pump

(d) measuring means for measuring a flow quantity of the fuel which is supplied through said fuel supplying hose

(e) a mode setting switch provided on said fuel supplying hose at a position in a vicinity of said fuel supplying nozzle

(f) discriminating means coupled to said measuring means and said mode setting switch for discriminating whether the fuel supplying apparatus is in a state before a fuel supplying operation is started or in a state during the fuel supplying operation in response to an output of said measuring means, and for setting the fuel supplying apparatus in a preset quantity supplying mode when said mode setting switch is manipulated in the state before the fuel supplying operation is started and setting the fuel supplying apparatus in an integral quantity supplying mode when said mode setting switch is manipulated in the state during the fuel supplying operation, said discriminating means producing an output indicating the mode of the fuel supplying apparatus; and

(g) control means coupled to said discriminating means for controlling said driving means in response to the output of said discriminating means so that a preset quantity fuel supplying operation is performed to supply a fuel supplying quantity which is preset in response to a manipulation of said mode setting switch when the output of said discriminating means indicates the preset quantity supplying mode and an integral quantity fuel supplying operation is performed to supply a minimum integral fuel supplying quantity when the output of said discriminating means indicates the integral quantity supplying mode, said minimum integral fuel supplying quantity being greater than a quantity of supplied fuel at a time when said mode setting switch is manipulated.

4,627,553

FUEL SUPPLYING APPARATUS HAVING QUANTITY AND PRICE PRESET SWITCHES

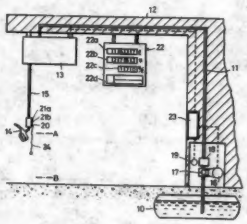
Takeomi Yoshida, Kanagawa; Kazuhisa Yamashita, Kawasaki, and Yukio Miura, Fujisawa, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Jan. 18, 1985, Ser. No. 692,913

Claims priority, application Japan, Jan. 20, 1984, 59-5857[U]

Int. Cl.[4] B67D *5/30*

U.S. Cl. 222—14 **5 Claims**



1. A fuel supplying apparatus comprising: a fuel supplying hose having a fuel supplying nozzle provided on a tip end thereof;

preset switch means comprising a fuel supplying quantity preset switch and a fuel supplying price preset switch provided on said fuel supplying hose at a position in the vicinity of said fuel supplying nozzle, said fuel supplying quantity preset switch being a switch for selectively and sequentially presetting a predetermined quantity of fuel for preset quantity fuel supplying operation in response to the number of manipulation times of the switch, said fuel supplying price preset switch being a switch for selectively and sequentially presetting a predetermined price of fuel for preset price fuel supplying operation in response to the number of manipulation times of the switch;

indicating means for indicating either one of the predetermined quantity and the predetermined price preset by said preset switch means; and

control means for presetting either one of the preset quantity or the preset price selected from a predetermined plural number of prsest quantities and a predetermined plural number of preset prices, in response to the selective manipulation of either one of said fuel supplying quantity preset switch and said fuel supplying price preset switch

as well as to the number of manipulation times of the selected switch, said indicating means indicating said preset fuel quantity or said preset fuel price preset in said control means,

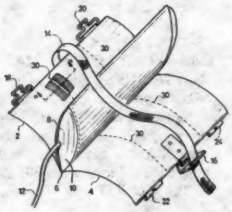
said control means changing the fuel supplying mode from one of the preset quantity fuel supplying mode and the preset price fuel supplying mode to the other mode, during a fuel supplying operation, whereby said selective manipulation of one of said fuel supplying preset switches places said apparatus in the respective fuel supplying mode and said fuel supplying mode is changed, during said fuel supplying operation, when the other of said fuel supplying preset switch is manipulated.

4,627,554

DEVICE FOR DISPENSING A LIQUID FROM A COLLAPSIBLE CONTAINER

Saul Leibinsohn, 11 Olei Hagardom Street, Rishon Lezion, Israel

Filed Jan. 24, 1985, Ser. No. 694,250
Int. Cl.[4] B65D *35/28*
U.S. Cl. 222—103 17 Claims



1. A device for dispensing a liquid from a collapsible container, comprising: a pair of elastic plates hingedly mounted to each other along one edge permitting them to be pivoted to an open position or to a closed position; a sleeve of flexible material secured to the pair of elastic plates along their hinged edges for receiving a liquid-filled collapsible container; each of said pair of elastic plates being pre-formed with a curve which is convex from the side facing said flexible sleeve such that when the liquid-filled collapsible container is received within said flexible sleeve and the two curved elastic plates are pivoted to their closed positions, they apply, due to their elasticity, a continuous force to the collapsible container for dispensing the liquid therefrom; each of said elastic plates being sectioned along parallel lines perpendicular to their hinged edges such as to permit compact folding of the assembly when not in use; and retainer means for releasably retaining said pair of elastic plates in their closed position.

4,627,555

INGREDIENT FEEDER APPARATUS

Michael P. Locke, 15 Reppert Blvd., Uniontown, Pa. 15401

Filed Apr. 19, 1985, Ser. No. 725,236
Int. Cl.[4] G01F *11/20*
U.S. Cl. 222—200 19 Claims

1. An ingredient feeder apparatus for adding a first ingredient to a second ingredient, said apparatus comprising:

(a) a hopper adapted to receive and discharge a first ingredient;

(b) a rotating auger located within said hopper, with a portion of said auger extending out of said hopper;

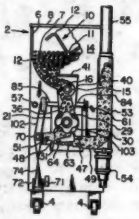
(c) a cylindrical auger housing surrounding the portion of said auger extending out of said hopper, said auger housing having a discharge opening formed therein;

(d) a metering wheel housing having a top positioned beneath said auger housing, said metering wheel housing having an inlet and an outlet formed therein and a metering wheel located within said metering wheel housing, with said inlet in said metering wheel housing being aligned with said auger housing discharge opening;

(e) a hollow chamber funnel pivotally mounted to said auger housing and surrounding said auger housing discharge opening, said funnel having a lower end spaced above the top of said metering wheel housing and said funnel being positioned to direct a first ingredient passing from said auger housing discharge opening and into said metering wheel housing inlet;

(f) means forming a passage having an inlet end and an outlet end and extending beneath said metering wheel housing outlet, said passage having an intermediate opening in communication with said metering wheel housing outlet, whereby a first ingredient discharged from said metering wheel housing outlet is dispensed into a second ingredient flowing through said passage;

(g) means for oscillating said funnel relative to said auger housing which includes a first arm connected to said funnel and extending outwardly therefrom over the top of



said metering wheel housing, a second arm connected to said funnel and extending outwardly therefrom over the top of said metering wheel housing and in a direction generally opposite that of said first arm, resilient means connecting said first arm to a fixed point, and means connecting said second arm to a vertically reciprocating means; and

(h) means for periodically and abruptly stopping the oscillation of said funnel, said means generating a force on said funnel sufficient to jar loose any first ingredient which becomes lodged in said funnel or in said metering wheel housing inlet, whereby said oscillation of said funnel results from both the force exerted on said second arm from said reciprocating means and from the force exerted on the first arm when the resilient means is tensioned during the motion of said funnel about said auger housing from said reciprocating means and the oscillation of said funnel being periodically and abruptly stopped when said first arm and said second arm strike the top of said metering wheel housing.

4,627,556

ICE DISPENSER FOR A HOUSEHOLD REFRIGERATOR

Robert B. Brooks, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jul. 26, 1984, Ser. No. 634,745
Int. Cl.[4] B65G *65/46*; F25C *5/16*; G01F *11/24*
U.S. Cl. 222—240 12 Claims

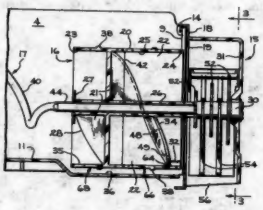
1. An ice piece dispenser comprising:

a receptacle for storing ice pieces and including a front plate having a discharge opening therein;

dispensing means horizontally supported in said receptacle and including,

a rotatable feed section having an inlet end and a discharge end and a central axle, said feed section comprising two separate bodies mated together and having a cylindrical collar adjacent the front plate and a double bladed screw auger forming two helical passages, said blades extending from the central axle to the collar with

the junction of the blades and central axle being spaced rearwardly from the front plate and the trailing edge of each blade being curved rearwardly in the direction of the inlet end of the feed section between the axle and collar sufficiently to prevent ice pieces being wedged



between the front plate and the blades during rotation of the feed section,

a rotatable wire auger secured to the rotatable feed section, and

drive means engaging the rotatable wire auger at the end opposite the feed section.

4,627,557

APPARATUS FOR REVERSING HOSE

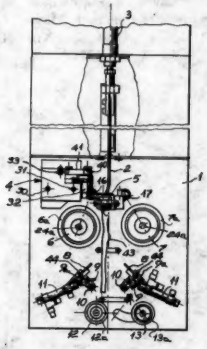
Armando Canton, Solbiate Arno, Italy, assignor to Fadis S.p.A., Solbiate Arno, Italy

Filed Sep. 30, 1985, Ser. No. 782,297

Claims priority, application Italy, Sep. 28, 1984, 22902 A/84

Int. Cl.[4] D05B *21/00*

U.S. Cl. 223—39 **10 Claims**



1. An apparatus for reversing hose, comprising:

gripper means engageable with a toe of an article of hose to be reversed, with said article depending from said gripper means and shiftable horizontally from a position in which said gripper means engages said article into a reversing position;

a first pair of rollers disposed at said reversing position and receiving said article between them and relatively displaceable toward and away from one another to engage said article below said toe upon displacement of said article by said gripper means into said reversing position;

a vertically elongated blade disposed above the first pair of rollers and provided with means for lowering said blade whereby said blade is engageable with said toe of said article to carry said toe downwardly between said rollers of said first pair while counterrotation of said rollers causes said article to turn inside out along said blade; and

a second pair of rollers disposed below said first pair and engageable with said article on said blade while being rotatable opposite the rollers of said first pair to draw the article, turned inside out, off said blade.

4,627,558

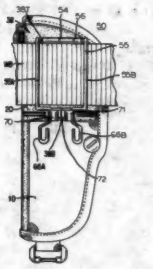
UNIVERSAL MILITARY HOLSTER

John E. Bianchi; Martin R. Miller, and Richard D. E. Nichols, all of Fallbrook, Calif., assignors to Bianchi International, Temecula, Calif.

Filed Sep. 26, 1984, Ser. No. 655,036

Int. Cl.[4] F41C *33/02*

U.S. Cl. 224—238 **8 Claims**



1. A holster including a sheet of material formed to define a pouch having a pair of major faces with an opening for the insertion and removal of a handgun therefrom;

an overlying layer on each of the major faces of said holster;

said overlying layer including a pair of generally horizontal slots aligned above one another and with the next adjacent layer defining a flat passage therebetween;

clip means including a first portion including a substantially flat region generally coextensive in width with said flat passage and with length greater than the distance between said slots engagable with said holster through said slots and said flat passage and said clip means including a pair of overlying pivotal resilient means extending at least the distance between said slots adapted to enclose a belt between the adjacent overlying layer and said overlying pivotal resilient means;

the first portion of said clip means including a hinge for said pivotal resilient means positionable in the region of one of said slots and a catch for said overlying pivoted resilient means spaced from said hinge a sufficient distance to extend out of the other of said slots.

4,627,559

ROOF RACK FOR A VEHICLE

Sven R. Andersson, Sollebrunn, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Jun. 19, 1984, Ser. No. 622,249

Claims priority, application Sweden, Jun. 20, 1983, 8303535

Int. Cl.[4] A45C *1/04*

U.S. Cl. 224—329 **8 Claims**

1. Roof rack section for a vehicle, comprising a crossbeam provided at either end with a foot which is formed with mounting means for enabling mounting of the roof rack section above the vehicle roof in a transverse direction, characterized in that said mounting means at each foot comprises at least two fixed

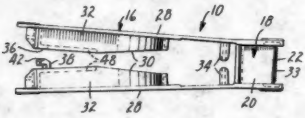
location pins which are directed inwardly in the longitudinal direction of the crossbeam, and adapted for accommodation in permanent recesses in the vehicle body intended for this purpose when the roof rack section is fitted to the vehicle, and in that said roof rack section is provided with clamping means which can, by manual operation, cause the feet to assume different mutual spacing and thereby enable clamping the section to the vehicle body by the feet being caused to bear against the respective sides of the vehicle body, while the locating pins locate in the recesses in the vehicle body.

4,627,560

DISPENSER FOR TAPE WOUND ON THREE INCH CORES

Bruce E. Samuelson, West Lakeland Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 22, 1985, Ser. No. 736,255
Int. Cl.[4] B65D *85/672*
U.S. Cl. 225—66 **3 Claims**



1. In a tape dispenser comprising a frame including a tape guide portion having inner and outer ends, oposite edges extending between said ends, and a generally planar tape guide surface; side wall portions attached to said opposite edges of said guide portion and including parts projecting past the inner end of said guide portion; and arcuate hub portions having an axis attached to and projecting inwardly from said parts of said side wall portions in oposed positions spaced from said guide portion, said hub portions being adapted to support a roll of pressure sensitive adhesive coated tape for rotation about said hub portions with the periphery of said roll spaced from the inner end of said guide portion; and means for cutting the tape disposed along the outer end of said guide portion; the improvement wherein said hub portions are adapted to suport a roll of pressure sensitive adhesive coated tape having a three inch diameter central opening, one of said hub portions has a rib projecting at generally a right angle to said axis, and the other of said hub portions includes walls defining a slot adapted to receive said rib in a close fitting relationship, said rib and said walls defining said slot being disposed only along parts of said hub portions diametrically opposite parts of said hub portions adjacent said tape guide portion, and said hub portions and said parts of said side wall portions being resiliently bendable to facilitate positioning said rib in said slot to restrict relative movement of said hub portions in a direction parallel to said axis during use of the dispenser, and to facilitate removing said rib from said slot to change the roll of tape.

4,627,561

FIBER OPTIC TERMINUS CLEAVING APPARATUS

Marik Balyasny, Van Nuys; Kenneth B. Baldwin, Newbury Park, and William E. Lovell, Los Angeles, all of Calif., assignors to G&H Technology, Inc., Santa Monica, Calif.

Filed Nov. 12, 1985, Ser. No. 796,703
Int. Cl.[4] C03B *37/16*
U.S. Cl. 225—96 **12 Claims**

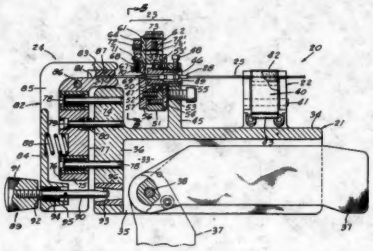
1. Apparatus for cleaving the end portion of an optical fiber extending from a contact within which it is held such that the cleaved fiber end is located slightly recessed within the contact, comprising:

a base;

selectively releasable fiber holding means mounted on the base;

fiber pretensioning means mounted on the base for clampingly engaging the fiber end portion and placing it in tension along the fiber longitudinal axis; and

fiber scoring means mounted on the base intermediate said holding means and said pretensioning means including;



rotor means having a bore extending therethrough, the bore axis coinciding with the rotational axis of said rotor means,

means for supporting the contact within the rotor means bore in a fixed predetermined position, and

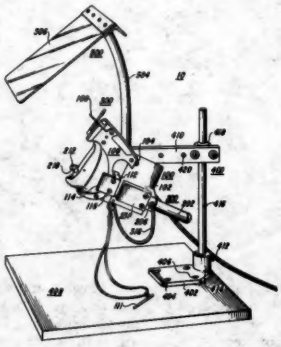
knife blade means mounted to rotate with said rotor means and having a knife edge means for contacting the fiber end portion at the point at which said fiber end portion leaves the contact for scoring the fiber on rotor rotation.

4,627,562

OPERATION OF TRIGGER ACTUATED DEVICES

Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Nov. 13, 1984, Ser. No. 670,104
Int. Cl.[4] A43D *69/00*
U.S. Cl. 227—67 **6 Claims**



1. In combination: a hand-holdable fastener dispensing gun which includes a pivoted trigger, means for supporting and for pivoting said gun to a prescribed position to facilitate the operation thereof by an operator;

wherein said means for supporting and for pivoting said gun further comprises means for mounting and aligning said gun, a source of high pressure fluid, a trigger pulling assembly responsive to said source, means for cooperating with said trigger pulling assembly for controlling said source, and support means cooperating with said means for mounting and aligning to retain said gun in a nonvertical operational position;

and wherein said means for supporting and for pivoting said

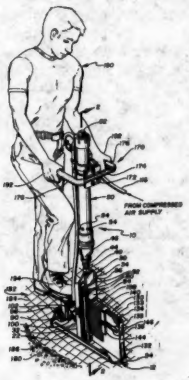
gun further comprises an attachment plate rotatably mounted to said support means, and in fixed relation to said means for mounting and aligning, and an extension bar attached to said attachment plate.

4,627,563

DEVICE FOR DRIVING U-SHAPED ANCHORS INTO THE GROUND

Dennis W. Meyer, 635 Julie St., Willmar, Minn. 56201

Filed Aug. 20, 1985, Ser. No. 767,785
Int. Cl.[4] B25C *5/06, 5/13*
U.S. Cl. 227—130 **12 Claims**



1. A device for driving a U-shaped anchor into the ground comprising an elongated sole plate having a bottom surface adapted to engage the upper surface of sheet-like material at a site where the anchor is to be inserted, said sole plate having a transverse slot therein possessing a rectangular shape through which said anchor is to be driven, means on said sole plate for advancing said U-shaped anchor in a horizontal and longitudinally directed relation to said sole plate into registry with said transverse slot, actuating means on said sole plate including a plunger having a lower end corresponding generally to the rectangular shape of said slot for striking the closed end of said U-shaped anchor, guide means engaging said plunger to maintain the lower end thereof in an angularly oriented relationship with said transverse slot so as to cause the lower end of said plunger to drive said anchor downwardly through said slot, through said material and into the ground, and means for limiting the downward travel of said actuating means and hence the downward travel of said plunger so that the lower end of said plunger projects a distance slightly beneath the bottom surface of said sole plate when said plunger has completed its downward stroke.

4,627,564

APPARATUS FOR FORMING A TRUSS ASSEMBLY

Donald M. Bowser, Barrie, Canada, assignor to Truswal Systems Corporation, Madison Heights, Mich.

Filed Mar. 2, 1984, Ser. No. 585,906
Int. Cl.[4] B27F *7/15, 7/32*
U.S. Cl. 227—152 **15 Claims**

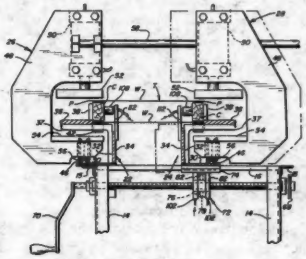
1. An apparatus for forming a truss assembly having a pair of spaced chords and a plurality of webs extending between the chords and connected thereto with connector portions, the apparatus comprising:

a frame;

first and second laterally spaced support rail means supported by said frame in generally parallel relation for receiving said chords and said webs for fabrication of the truss assembly;

means mounting said first and second support rail means for relative lateral movement with respect to each other; and

means for effecting said relative lateral movement of said first and second support rail means, comprising means for moving one of said support rail means laterally of said frame to facilitate formation of truss assemblies of varying finished heights, and fluid pressure means for urging said one support rail means toward the other of said support rail means during formation of said truss assembly,



said second support rail means being supported by said frame for lateral movement with respect thereto, said moving means comprising means for laterally moving said second support rail means,

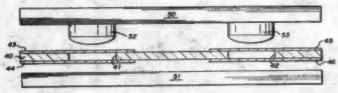
said apparatus including first and second pressure clamp means respectively mounted on said first and second support rail means for selective positioning longitudinally of said frame for applying clamping pressure to the connector portions of said truss assembly, said second clamp means being movable with said second support rail means laterally of said frame.

4,627,565

MECHANICAL BONDING OF SURFACE CONDUCTIVE LAYERS

Robert B. Lomerson, Rte. #9, Box 196, Fort Worth, Tex. 76179

Continuation of Ser. No. 359,607, Mar. 18, 1982, abandoned.
This application Apr. 16, 1984, Ser. No. 600,213
The portion of the term of this patent subsequent to Oct. 9, 2002, has been disclaimed.
Int. Cl.[4] B23K *20/06*
U.S. Cl. 228—107 **3 Claims**



1. A method for establishing an electrically conductive path through an insulating plate which comprises the steps of:

(a) forming a hole through said plate,

(b) placing conductive material over each opening of said hole and in flush contact with each surface of said plate, and

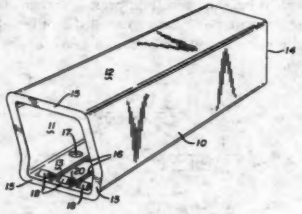
(c) applying opposed forces against said conductive materials to drive them into contact through said hole where said forces are of magnitude and character to produce a cold weld metallurgical junction between said conductive materials at the zone of contact where said opposed forces are applied by the shock wave created by the detonation of an explosive material.

4,627,566

NEWSPAPER DELIVERY TUBE WITH NEWSPAPER RETAINING FLAPS

C. Kenneth Fibus, Youngstown, Ohio, assignor to The Steel City Corporation, Youngstown, Ohio

Filed Jul. 22, 1985, Ser. No. 757,422
Int. Cl.[4] B65D 91/00
U.S. Cl. 232—1 C 9 Claims



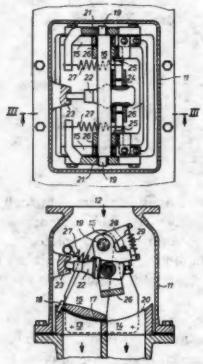
1. A newspaper delivery tube for the deposit of newspapers and the like having means for retaining newspapers therein and comprising a tubular body having upper, lower and side walls with inner and outer surfaces and an open end and a closed end, said newspaper retaining means consisting of a plurality of flaps normally extending upwardly from said inner surface of said lower wall and positioned transversely of said lower wall and adjacent said open end of said tubular body, said tubular body being formed of a resilient deformable synthetic resin with said flaps formed in said lower wall in first positions on a plane common with said lower wall and movable to second positions upstanding with respect to said first positions, means on said flaps for normally holding the same in said upstanding second positions relative to said lower wall of said tubular body.

4,627,567

PIVOTAL SLIDE VALVE

Walter Thorn, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 10, 1985, Ser. No. 774,456
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1984, 3444417
Int. Cl.[4] F01P 7/16; F16K 11/052
U.S. Cl. 236—34.5 12 Claims



1. A pivotal slide valve for the temperature-dependent control of the through-flow of a cooling medium, comprising valve housing means provided with an inlet and two outlet openings, a closure member constructed as pivotal slide valve member pivotable to control the flow through the two outlets and supported on a shaft, the shaft being eccentrically supported in the valve housing means by way of bearing means connected with the valve housing means, a valve actuating working element in the valve housing which is circumcirculated by the cooling medium and supported at the valve housing means, and counter-abutment means in the housing attached to and movable by the working element, said counter-abutment means being supported in a lug means securely connected with said shaft, the lug means being provided with an adjustable stop means for connecting and driving the pivotal slide valve member between the two outlets after a predetermined movement of the counter-abutment means.

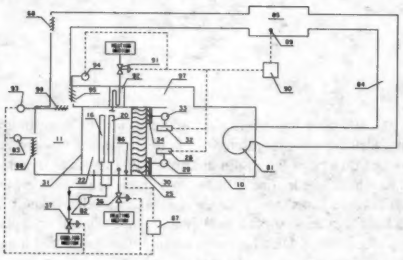
9. A pivotal valve element according to claim 1, wherein the working element is temperature responsive to the cooling medium to expand and move the counter-abutment means in response to a heating of the cooling medium.

4,627,568

MOISTURE ELIMINATOR FOR AIR WASHER

Richard P. Lortie, Winston-Salem, N.C.; Philippe H. Vercaemert, Littleton, Mass., and Douglas L. Gunnell, Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 11, 1984, Ser. No. 599,245
Int. Cl.[4] G05D 21/00; B01D 19/00
U.S. Cl. 236—44 B 19 Claims



1. An air conditioning system for maintaining a conditioned zone at predetermined temperature and humidity levels comprising in combination

(a) an air washer comprising a water spray section, means for supplying water to said water spray section and for collecting excess spray water, and a moisture eliminator adjacent to said water spray section having a maximum effective face area through which a stream of air to be treated by the air washer passes,

(b) damper means for admitting to said air washer for treatment controlled quantities of outside air and air returned from said conditioned zone,

(c) means for moving variable volumes of air per unit of time through said air washer, and

(d) means for changing the effective face area of said moisture eliminator in response to changes in the volume of air moving through the air washer per unit of time.

4,627,569

FOUR FUNCTION PNEUMATIC CONTROLLER

John C. Morris, Castro Valley, Calif., assignor to Staefa Control System Inc., San Diego, Calif.

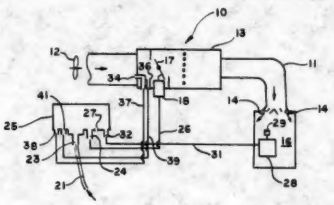
Filed Jun. 10, 1985, Ser. No. 743,163
Int. Cl.[4] F24F 7/00
U.S. Cl. 236—49 18 Claims

1. A pneumatic controller for use in controlling air flow in a distribution system for supplying conditioned air to a room, comprising,

a housing with input ports for total air, static air, and main air supply, for connection to conduits leading to a velocity probe and a static air monitor in a duct of the system, and to a supply of compressed air, and with an actuator output port for connection to a conduit leading to an actuator or motor operating an air flow damper in the duct, for control of the actuator by the controller,

differential pressure responsive valve means in the housing for receiving total air and static air inputs and for adjusting a flow of compressed air between the main air supply input port and the actuator output port in response to the magnitude of a pressure differential between the total air and the static air, said valve means comprising a single differential pressure responsive valve member for all modes of operation of the controller, and including spring means biasing the valve means against the influence of the pressure differential,

a reset unit connected to the housing with a reset input port for connection to a conduit leading to a thermostat in the



room, of the type which adjusts a flow of compressed supply air in response to changes in temperature in the room relative to a set point temperature on the thermostat, the reset unit including air pressure responsive shifting means for controlling the position of a spring-biased movable shifter in response to input of compressed air at the reset input port,

reset means for adjusting the pressure of the spring means to thereby adjust the level of pressure differential required to move the differential pressure responsive valve means against the spring means, in response to movement of said shifter in the reset unit, and

system variation accommodation means for enabling reconfiguration of the controller as a direct acting/direct reset controller, a reverse acting/reverse reset controller, a direct acting/reverse reset controller or a reverse acting-/direct reset controller, to accommodate different types of actuation and thermostats in different systems utilizing a single differential pressure responsive valve means.

4,627,570

FUEL INJECTION UNIT FOR EACH CYLINDER OF A DIESEL ENGINE

Josef Morell, and Harald Schmidt, both of Vienna, Austria, assignors to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Feb. 6, 1984, Ser. No. 577,133
Claims priority, application Austria, Feb. 17, 1983, 541/83
Int. Cl.[4] F02M *47/00*
U.S. Cl. 239—90 **9 Claims**

1. A fuel injection unit for each cylinder of a diesel engine, said fuel injection unit comprising a housing,

a pump cylinder within said housing, said pump cylinder having an inner wall defining a working surface having a predetermined inner diameter,

a section chamber communicating fuel to said pump cylinder through a fuel bore,

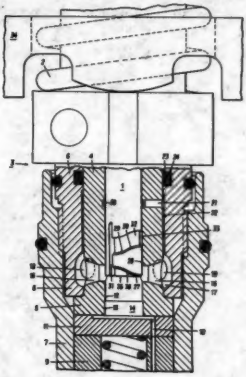
an injection nozzle communicating with said pump cylinder, said injection nozzle having a spring-loaded needle valve for delivery of fuel from said pump cylinder to said diesel engine cylinder,

a cover disposed between an end of said pump cylinder and said injection nozzle,

a securing flange disposed between said fuel bore and said cover,

tensioning means for stressing said securing flange against said cover, and

a piston disposed within said pump cylinder, said piston including a front end facing said cover, said piston having a peripheral surface having a predetermined outer diameter, said peripheral surface separated from said working surface of said pump cylinder by a very small clearance, said piston being rotatably and reciprocally movable within said pump cylinder, said piston passing over said fuel bore with its front end during its reciprocal movement within said pump cylinder, said piston being pro-



vided with slanted front and rear control edges for regulating the quantity of fuel communicated to said pump cylinder through said fuel bore, said slanted front control edge being located adjacent to said front end of said piston,

wherein said pump cylinder includes a cylindrically offset region of said working surface having an inner diameter which is larger than said predetermined inner diameter, said region of enlarged inner diameter being located opposite to said securing flange, and

wherein said front control edge of said piston is formed on the peripheral surface of said piston with a first recess and a step adjacent thereto, so that the outer diameter of said first recess and step are smaller than said predetermined outer diameter.

4,627,571

FUEL INJECTION NOZZLE

Masaaki Kato; Hirotaka Nakatsuka, both of Kariya; Shigeki Tojo, Mie, and Kazuyoshi Arai, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 14, 1985, Ser. No. 711,838
Claims priority, application Japan, Mar. 15, 1984, 59-49664
Int. Cl.[4] F02M *47/02*
U.S. Cl. 239—90 **8 Claims**

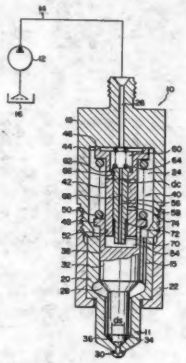
1. A fuel injection nozzle which is adapted to be connected to a fuel injection pump and which serves to inject fuel into a combustion chamber in an internal combustion engine, comprising:

a body in which a suction passage and an accumulating chamber are defined, the suction passage being adapted to be connected with a fuel injection pump and the accumulating chamber being connected with the suction passage;

a non-return valve means for allowing the fuel to flow from the suction passage to the accumulating chamber but

prohibiting the fuel from flowing from the accumulating chamber to the suction passage, thereby storing the fuel in the accumulating chamber, the fuel being supplied from a fuel injection pump and having a certain pressure and amount, and the non-return valve means including a valve nember which is arranged in the accumulating chamber, is movable along the axis of the body and is urged, with a predetermined force, in a direction for closing the connection between the suction passage and the accumulating chamber, a connector recess being formed at one end of the valve member that faces the suction passage, the connector recess communicating with the suction passage even when the connection is closed;

a needle valve means for injecting the fuel stored in the accumulating chamber into a combustion chamber in an engine, the needle valve means including a nozzle needle



arranged coaxially and in series with the valve member with end portions thereof being adjacent, the nozzle needle being urged in the opposite direction to the valve member, one of the adjacent end portions of the valve member and the nozzle needle being slidably and liquid-tightly fitted into the other to define therein a damping chamber;

a damping plunger coaxially fitted into the valve member in the manner that the damping plunger is urged toward the nozzle needle and has one end protruding into the damping chamber and engageable by the nozzle needle, the damping plunger including a through hole for communicating the damping chamber with the connector recess; and

throttle means disposed in the through hole in the damping plunger, for restricting the fuel flow between the damping chamber and the connector recess.

4,627,572

MODULAR CENTRAL-PILLAR ASSEMBLIES FOR CENTER-PIVOT IRRIGATION APPARATUS

Theodore V. Olson, Box 758, and Theodore D. Olson, Jr., R.R. 4, both of Atkinson, Nebr. 68713

Continuation-in-part of Ser. No. 515,780, Jul. 21, 1983, abandoned. This application Jan. 24, 1985, Ser. No. 694,655

Int. Cl.[4] B05B *3/00*

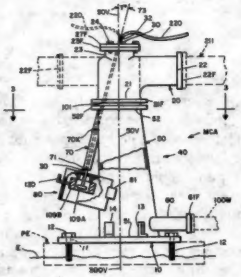
U.S. Cl. 239—728 **7 Claims**

1. For a self-propelled sprinkler irrigation apparatus of the type comprising a lenghty water distributing conduit elevated above the earth's surface and adapted to rotate as an axis around a vertical-axis center-pivot site, said site including an earth anchored member and a water inflow-pipe leading toward the vertical-axis, a modular portable central-pillar assembly providing the water flow connection between said inflow-pipe and the water distributing conduit thereabove, said modular central-pivot assembly comprising:

A. base means providing the lower terminus of the assembly and being attachable to the earth anchorable member;

B. outflow-elbow means located loftily above said base means, said outflow-elbow means having a generally horizontal lower inlet-end surrounding said vertical-axis and an outlet-end thereabove that is attachable to the lengthy water distributing conduit;

C. an upright tubular column surrounding a columnar-axis superimposable along said vertical-axis, said upright tubular column having an annular lower-end and an annular upper-end both surrounding said columnar-axis, said outflow-elbow means inlet-end surrounding the columnar-axis and being rotatably secured to the column upper-end whereby the outflow-elbow means is rotatable about the colinear vertical-axis and columnar-axis, said column lower-end being attached in fluid sealed relationship to the base means, said tubular column converging from lower-end to upper-end and providing sufficient columnar strength to maintain the laden outflow-elbow means elevated loftily above the base means and the earth anchorable member;



D. a water inlet-pipe intersecting the tubular column and adapted to be attached to said inflow-pipe;

E. a tubular oblique-pipe angularly depending as a branch from the tubular column and communicating therewith nearer to the upper-end than to the lower-end, said oblique-pipe throughout surrounding a linear branch-axis that intersects the columnar-axis at an intersection-point located above the inlet-end of the outflow-elbow means;

F. a linear drive-conduit surrounding said linear branch-axis and having a medial length portion surrounded by and being in water sealing engagement with the oblique-pipe, the drive-conduit having an upper length portion in water sealing engagement relationship with the outflow-elbow means loftily above the lower inlet-end and being in co-rotatable engagement with the outflow-elbow means, and the drive-conduit having a lower length portion located below the oblique-pipe and carrying an armature portion of the electrical commutation means; and

G. a brushes-holder in electrical commutation relationship with said armature portion, said brushes-holder being attached to the tubular column member of said central-pillar assembly.

4,627,573

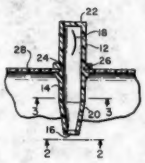
PRESSURE COMPENSATOR/EMITTER

Glenn G. Havens, deceased, late of La Messa, by Florine P. Havens, executrix, and by Richard C. Thompson, executor, San Diego, all of Calif., assignors to Havens International, San Diego, Calif.

Continuation-in-part of Ser. No. 251,180, Apr. 4, 1981, abandoned. This application Feb. 17, 1984, Ser. No. 581,286

Int. Cl.[4] B05B *1/30*

U.S. Cl. 239—542 4 Claims



1. A pressure compensating flow control device for compensating for irregular pressure for maintaining a predetermined generally uniform flow rate over a predetermined pressure range comprising:

a flexible tubular member having collapsible walls of a substantially uniform thickness defining a central bore, an inlet end having an inlet orifice for communicating with a fluid source, and an outlet end having an outlet port; said inlet orifice and outlet port communicating with said central bore, said inlet orifice having a teardrop cross sectional configuration and said central bore collapsing such that as fluid source pressure varies from zero to a first pressure the flow rate increases from zero to a maximum flow rate and as fluid source pressure varies from said first pressure to a second higher pressure said maximum flow rate is substantially maintained.

4,627,574

FILTER FOR FUEL INJECTION NOZZLE

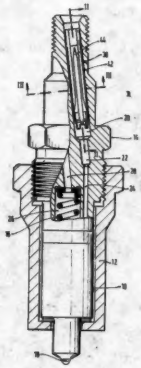
Karl Hofmann, Remseck, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,950

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1982, 3201218

Int. Cl.[4] B05B *1/14*

U.S. Cl. 239—590.5 10 Claims



1. A fuel injection nozzle for internal combustion engines comprising a rod-shaped filter body disposed in a fuel inlet conduit upstream of an ejection orifice, said rod-shaped filter body is provided with collars disposed on opposite ends thereof, said collars arranged to fit snugly within said fuel conduit, said rod-shaped filter body is further provided with a central section between said collars which has a uniform diameter which is less than the diameter of each of said collars and forms a mantle surface in which two groups of longitudinal grooves are formed, one of said two groups of longitudinal grooves originating at an outer end of a collar on one end of said filter and the other group of said two groups of longitudinal grooves originating at an outer end of said collar on the opposite end of said filter, each of said groups of longitudinal grooves having an extent and a terminus in said central section, in which the width and depth of each longitudinal groove of each of said groups of longitudinal grooves is formed with a constantly changing cross section which continuously decreases over the entire length of said extent towards said terminus in said central section between said collars, each longitudinal groove of said group of longitudinal grooves includes a straight base line located in a plane which is disposed parallel to and spaced apart by a distance a from a plane through the longitudinal axis of said filter body, and said straight base line of each said longitudinal grooves being disposed at an angle (β) from the longitudinal axis of the filter body.

4,627,575

UPGRADING SOLID FUELS

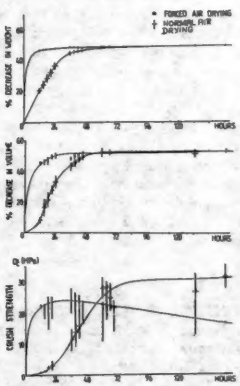
Reginald B. Johns, North Balwyn; Alan L. Chaffee, Ashfield; David A. Cain, Heidelberg, and Alan S. Buchanan, Kallista, all of Australia, assignors to University of Melbourne and CRA Services Limited, both of Victoria, Australia

Filed Feb. 15, 1984, Ser. No. 580,260

Claims priority, application Australia, Feb. 17, 1983, PF8078

Int. Cl.[4] B02C *23/18*

U.S. Cl. 241—15 23 Claims



1. Process for treatment of brown coal which comprises subjecting the said brown coal to shearing forces to produce a wet plastic mass said mass being capable of conversion by subsequent compaction and drying into a fuel of increased density and enhanced calorific value.

4,627,576

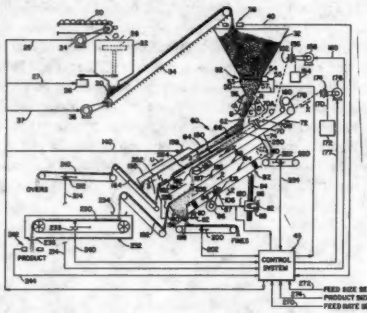
DIFFERENTIAL RATE SCREENING

William F. Hahn, 2500 Fidelity Building, Philadelphia, Pa. 19109; Hirimie T. McAdams, Clarence, and Robert L. Talley, Marilla, both of N.Y., assignors to William F. Hahn, Devon, Pa.

Continuation of Ser. No. 366,961, Apr. 9, 1982, Pat. No. 4,544,101, and a continuation of Ser. No. 366,965, Apr. 9, 1982, Pat. No. 4,544,102. This application Apr. 11, 1985, Ser. No. 722,209

Int. Cl.[4] B02C *23/14, 23/16*

U.S. Cl. 241—24 12 Claims



1. A differential rate screening apparatus for continuously screening a feed of particulate material so as to provide a product having a preselected size distribution substantially different from a predetermined size distribution of said feed which has particles distributed among a plurality of substreams each of a different size class, said screening apparatus comprising screen means having a screening member; feed means for introducing a stream of said feed onto said screening member, said screening member having apertures of sufficient size to pass at least two of said substreams as undersize substreams; separation means for separating said feed stream into at least a first throughs stream and one other first stream by causing part of each of said undersize substream to pass through the apertures of said screening member and into said first throughs stream at first partial flow rates substantially greater than zero and substantially less than conventional flow rates at which said undersize substreams would pass through the apertures of said screening member upon screening said undersize substreams to provide essentially complete screening, said first partial flow rates being such as to provide control over the size distribution of said first throughs stream; and control means for controlling said first partial flow rates so as to provide substantially said preselected size distribution in a particulate product stream comprising at least a portion of at least one of said first throughs stream and said other first stream, said control means including means for controllably varying the relative flow rates at which said undersize substreams pass into said first throughs stream.

4,627,577

FLOW CONTROL SYSTEM IN SHREDDING MACHINE

Kounosuke Hyuga, Naka; Koutaro Nakamura, Kamakura, and Shouzou Ogawa, Ibaraki, all of Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,488

Claims priority, application Japan, Dec. 27, 1983, 58-244866

Int. Cl.[4] B02C *25/00*

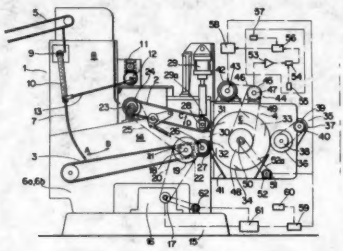
U.S. Cl. 241—30 14 Claims

1. A flow control system in combination with a shredder having raw material conveyor means upstream of a rotary shredder means, comprising:

(a) torque measuring means for connection to a shredder means for monitoring the operating torque of the shredder means;

(b) tachometer means for connection to the shredder means for monitoring the number of revolutions per unit time of the shredder means;

(c) means for generating a target constant;



(d) means for comparing the product of the measured torque and the number of revolutions with said target constant; and,

(e) speed control means for connection to the shredder means for regulating the rotary speed of the shredder means in response to deviations of the product with said target constant so that a constant shredding rate is maintained.

4,627,578

METHODS OF AND/OR APPARATUS FOR DETECTING AND CONTROLLING REFINER PLATE CLASHING

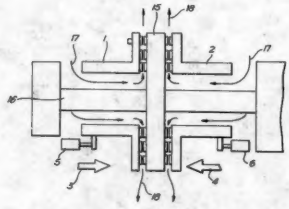
Donald M. Whyte, Kawerau, New Zealand, assignor to Tasman Pulp and Paper Company Limited, Kawerau, New Zealand

Filed Dec. 18, 1980, Ser. No. 217,805

Claims priority, application New Zealand, Dec. 19, 1979, 192459

Int. Cl.[4] G08B *21/00;* B02C *7/14*

U.S. Cl. 241—30 14 Claims



1. A method of predicting the clashing of refiner plates comprising the steps of sensing the vibration of at least one refiner plate during normal safe operation, sensing decreases in vibration of said at least one refiner plate due to a reduction in the quantity of material flowing between said refiner plates, and producing a signal in response to said decrease in vibration.

4,627,579

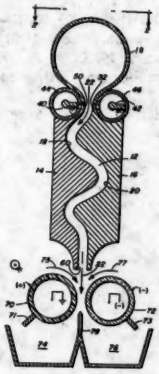
PARTICLE CHARGING AND COLLECTING SYSTEM

Stanley R. Rich, Wellesley Hills, Mass., assignor to Advanced Energy Dynamics, Inc., Natick, Mass.

Continuation-in-part of Ser. No. 520,649, Aug. 5, 1983, abandoned. This application Jun. 5, 1984, Ser. No. 617,319

Int. Cl.[4] B02C *19/00*

U.S. Cl. 241—79.1 14 Claims



1. Apparatus for the benefication of a finely-comminuted feed coal which includes both coal and impurity constitutents comprising a tubular envelope providing a contact surface, means rotatable within said envelope to bring said feed coal into contact with said surface, including means within and extending along the axis of said envelope to supply said feed coal to said rotatable member, and means to rotate said rotatable member at an angular speed sufficient to accelerate said feed coal to a velocity relative to said surface sufficient to fracture and further comminute the feed coal and to impart respective high differential electical charges to the coal and impurity constituents of said feed coal, and, located downstream of said contact surface, for receiving the output of said further comminuted and differentially charged constituents, electrical means to separate the coal constituent physically from the impurity constituent.

4,627,580

APPARATUS FOR SEVERING FOAMED MATERIAL

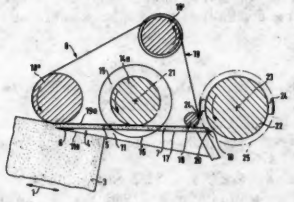
Karl G. Marbach, Weinsberg, Fed. Rep. of Germany, assignor to Karl G. Marbach GmbH & Co., Heilbronn, Fed. Rep. of Germany

Filed Oct. 2, 1984, Ser. No. 657,006

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1983, 3336562

Int. Cl.[4] B02C *18/06, 19/12*

U.S. Cl. 241—101.4 26 Claims



1. Apparatus for comminuting layers which are obtained in response to slitting of a block of foamed material, comprising means for advancing the layer in a predetermined direction along a predetermined path; a first severing device adjacent to a first portion of said path and including a driven shaft extending transversely of said path and a plurality of tools arranged to subdivide each layer into elongated strips which move along said path lengthwise beyond said first portion, said tools including spaced-apart rotary disc-shaped knives on said shaft; a second severing device adjacent to a second portion of said path which is disposed downstream of said first portion, as considered in said direction, said second severing device being arranged to repeatedly sever the oncoming strips transversely of said direction so that each strip yields a succession of discrete chips, said advancing means comprising a plurality of endless flexible conveyors disposed in planes extending in parallelism with said direction and at right angles to said path, said conveyors having stretches which extend between said path and said shaft intermediate said knives along and beyond the first portion of said path to engage and entrain the strips in said direction into the range of said second severing device; a third severing device having a knife arranged to sever layers from the block; and means for effecting a relative movement between the block and said third severing device so that the latter removes layers from the block.

4,627,581

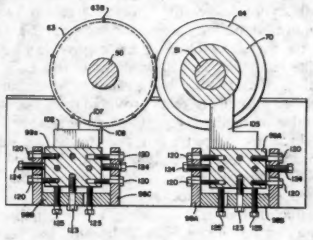
ANTI-FOUL DEVICE FOR TIRE CARCASS CUTTING AND SHREDDING APPARATUS

William E. Holiman, and Henry O'Keefe, both of Houston, Tex., assignors to Tire-Gator, Inc., Houston, Tex.

Filed Jun. 24, 1985, Ser. No. 747,847

Int. Cl.[4] B02C *18/14*

U.S. Cl. 241—167 5 Claims



1. For use with a tire carcass shredding apparatus having a base frame in which are journalled at least one pair of opposed parallel shafts on which are carried slotted mandrels and cutter blades having spacers between each adjacent mandrel and cutter blade all being spline mounted for rotation with each shaft and forming cutter assemblies, the cutter blades being carried by one shaft entering the slots of the mandrels of the opposed shafts; an anti-foul device comprising an inverted U-shaped support bar means for each of said opposed parallel shafts, clean out fingers and anti-foul fingers carried by and positionable along the major axis of said inverted U-shaped support bar means for cleaning interdigitation between said mandrels and cutter blades, there being foul fingers positionable along each said support bar means and the axis of said cutting mandrels and discs for engagement with the cutter assemblies, and means adjustably connected between said base frame and each support bar means carrying said clean out fingers and said anti-foul fingers for moving the fingers securely supported on said U-shaped support bar means toward and away from the cutter blades and mandrels of each cutter assembly to remove debris entrapped within and between said cutter assemblies resulting from shredding tires.

4,627,582
APPARATUS FOR COMMINUTION OF WASTE MATERIAL SUCH AS PAPER BLOCKS

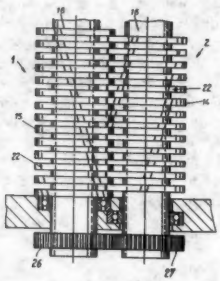
Albert Goldhammer, Uberlingen, Fed. Rep. of Germany, assignor to Firma Feinwerktechnik Schliecher & Co., Markdoff, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 362,466, Mar. 26, 1982, abandoned. This application Feb. 12, 1985, Ser. No. 700,911

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1981, 3112639

Int. Cl.⁴ B02L *18/06*

U.S. Cl. 241—236 **9 Claims**



1. An apparatus for the comminution of waste material, suchs as thick paper blocks, which can include metal fasteners and a plurality of sheets greater than 50 in number; comprising:

opposing cutter blocks mounted in parallel and driven in counter-rotating directions in meshing relationship with regard to each other,

each cutter block having a plurality of knife disks of generally cylindrical configuration spaced from each other and intermeshing with a plurality of similar knife disks of an adjacent cutter block so as to provide primarily scissor-like knife cuts to said waste materials, each of said knife disks of said cutter blocks having at its outer circumference a plurality of teeth provided with a saw-tooth profile, and said teeth having two convergingly inclined sides which are spaced apart at a top edge, said saw tooth profile performing a sawing action on said waste material when same is in near to clogging positions between said opposing cutter blocks,

said inclined sides including a leading inclined side and a lagging inclined side, said leading and lagging inclined sides each having an angle of predetermined inclination, the angle of inclination of said leading inclined side being greater than the angle of inclination of said lagging inclined side,

both of said inclined sides having therebetween said top edge forming a dull tip for each tooth; the top edge having, in circumferential direction, smaller dimensions than the distance between two adjacent top edges of the same knife disk, the axial length of said top edge being the same as the thickness of the generally cylindrical knife disk, and

each said knife disk having at least one groove with a groove bottom, said at least one groove being formed at the periphery of each said knife disk and at the trailing side of the saw tooth profile, and said groove bottom forming a wide base which is at least as wide as the distance between two adjacent top edges, said grooves being spaced from each other and interrupting the toothed outer circumference of said knife disk;

whereby said cutter blocks do not seize or jam when in use comminuting waste material even despite thick paper blocks having metal fasteners therein and more than 50 sheets, inasmuch as the toothed circumferences including the inclined sides and the dull tips of the teeth in combination with the grooves grab and draw said paper blocks into the opposing meshing cutter blocks in an incremental manner with a tip being formed continuously and repeatedly as sheets are drawn between said cutter blocks and the paper blocks become thinner and thinner, and such comminuting being formed without the need for any external forces bearing on or pressing said waste material against said cutter blocks.

4,627,583
WINDING EQUIPMENT

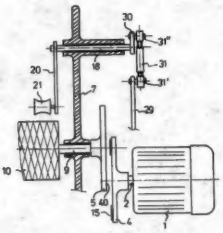
Franz X. Huemer, Sonnenuhrgasse 4, 1060 Vienna, Austria

Filed Aug. 2, 1985, Ser. No. 762,158

Claims priority, application Switzerland, Aug. 30, 1984, 04150/84

Int. Cl.⁴ B65H *59/38*

U.S. Cl. 242—45 **4 Claims**



1. A yarn winder which comprises:

a winder frame;

a bobbin shaft journaled on said frame and carrying a bobbin upon which a yarn is to be wound;

a driven plate mounted on an end of said bobbin shaft;

an electric motor having a drive shaft parallel to said bobbin shaft;

a drive plate on said drive shaft juxtaposable with said driven plate and magnetically couplable therewith to rotate said bobbin when said motor is energized, one of said plates being provided with permanent magnets, the other of said plates being composed of a magnetically permeable material for magnetic coupling with said permanent magnets;

support means for pivotally mounting said drive shaft for angular displacement about a pivot axis parallel to said shafts but offset from said drive shaft to displace said drive plate generally radially with respect to said driven plate to vary the magnetic coupling between said plates;

a dancing arm swingably mounted on said frame and provided with a dancing roller about which a loop of said yarn passes and forming a yarn-tension detector; and

means coupling said arm with said support means for swinging said drive shaft about said pivot axis to decrease said magnetic coupling by a said generally radial displacement of said drive plate in one direction upon an increase in yarn tension and to increase said magnetic coupling by a reverse generally radial displacement of said drive plate.

4,627,584
METHOD AND APPARATUS FOR FEEDING A PLASTIC RIBBON

Philip A. Kuhn, Canandaigua, and Paul V. Osborn, Webster, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 652,253, Sep. 20, 1984, abandoned. This application Mar. 18, 1986, Ser. No. 842,071

Int. Cl.⁴ B65H *16/00, 27/00, 23/04*

U.S. Cl. 242—54 R **33 Claims**

25. A plastic film tape feed apparatus comprising:

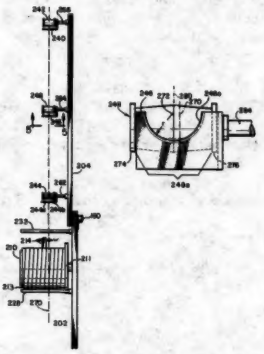
a spool having a multiplicity of wraps of a plastic film tape

around a spool surface having an axial length many times greater than the width of said tape;

a cylindrical turning surface proximal to the spool having an axial length approximately equal to the axial length of the wrapped surface of the spool;

a pulley spaced from said turning surface for redirecting the direction of the tape fed from the turning surface;

a concave tape guide surface adjoining the pulley, receiving said tape directly from said turning surface, increasing the wrap of said tape about said pulley and having a width transverse to the fed tape greater than said tape width and several times smaller than said axial length of the turning



surface and further having a fixed central plane of symmetry extending in a direction generally transverse to a central axis of said cylindrical turning surface;

said cylindrical turning surface being fixedly secured against transverse movement in a direction normal to said central plane of symmetry; and

the tape guide surface being positioned sufficiently far from the cylindrical surface such that the maximum angle in degrees between a tape fed from any point on said turning surface and said plane of symmetry is no greater than about 6.5 times the inverse of the width of said tape expressed in inches.

4,627,585

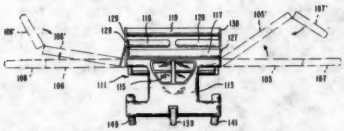
PUSHER TYPE AUTO-PLANE

Harry Einstein, 25 Midvale Dr., Springfield, N.J. 07081

Filed Jun. 25, 1984, Ser. No. 624,521

Int. Cl.[4] B64C *3/56, 37/00*

U.S. Cl. 244—2 **8 Claims**



1. In a Pusher type auto-plane for aircraft use and road vehicle use having both a Pusher aviation engine and an independent land vehicle engine, the improvement comprising:

(a) a Pusher type aircraft fuselage having a leading point and a trailing point, and having an imaginary centerline from said leading point to said trailing point;

(b) two main wings connected to said fuselage, each of said wings being cut twice approximately parallel to said imaginary centerline, once at about one-quarter and once at about three-quarters the distance in from the wing's outer tip to said imaginary centerline, so as to create a cut main wing and a segment tip for each of the two main wings, each of the two main wings being hinged at each of said two cuts, and, as to the cuts located at about three-quareters of the distance in from the wing's outer tip to said imaginary centerline, one of said two main wings being hinged along said cut at its top surface and the second of said two wings being hinged along said cut and above its top surface at a height at least one wing thickness above its top and at a height sufficient to allow both of said two wings to be folded inward 180° with one resting atop the other and with each of the segment tips being folded inwardly, one downward, and one upward, nesting between the two cut main wings in substantially the same horizontal plane;

(c) a rear stabilizer system having a horizontal stabilizer and two vertical stabilizers, an elevator functionally connected to said horizontal stabilizer and rudders functionally connected to said vertical stabilizers, said system being substantially symmetrical to said imaginary centerline;

(d) a Pusher propeller located at approximately the trailing point of said fuselage;

(e) at least three wheels located on the underside of said fuselage in an aviation landing relationship, at least one of said wheels being connected to be driven by an independent land vehicle engine; and,

(f) aviation controls located within said fuselage connectively related to a Pusher aviation engine, and said propeller, elevator and rudders.

4,627,586

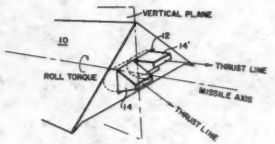
THRUST VECTORING APPARATUS FOR MANEUVERING MISSILE IN FLIGHT

Maigonis V. Krumins, Bethesda, and Leon H. Schindel, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1984, Ser. No. 665,866

Int. Cl.[4] F42B *15/033*

U.S. Cl. 244—3.21 **11 Claims**



1. In a jet exhaust propelled missile, associated thrust vectoring apparatus for imparting bank and pitch to the missile for maneuvering it in flight, comprising:

wall means defining a jet exhaust opening of generally rectangular cross section;

plug means disposed within the jet exhaust opening for defining a plug nozzle therein;

said plug means comprising a pair of generally two-dimensional plugs pivotally mounted in side-by-side adjacency on axes extending across the rectangular jet exhaust opening; and

means responsive to guidance commands for selectively pivoting each plug independently about its axis for vectoring thrust of jet exhaust gasses passing through the defined plug nozzle;

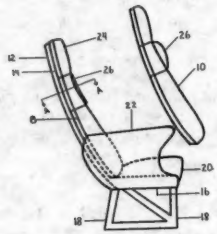
whereby, when the plugs are pivoted in opposite directions, the missile is caused to bank about its longitudinal extent, and when the plugs are both pivoted in the same direction the missile is caused to pitch about an axis transverse to its longitidinal extent thereby providing maneuvering of the missile in flight.

4,627,587

AIRPLANE SEAT WITH CONVERTIBLE FLOTATION-CUSHION SYSTEM

Diane R. McCutchan, 245 Hillview Dr., Fremont, Calif. 94536; Gretchen W. Roeding, and Gordon R. Kibby, both of Fremont, Calif., assignors to Diane R. McCutchan, Fremont, Calif.

Filed Jul. 18, 1984, Ser. No. 632,158
Int. Cl.[4] B64D *25/04*
U.S. Cl. 244—122 R **5 Claims**



1. An airplane passenger seat comprising:

a seat body having a back member and a seat member;

a back cushion;

means for removably attaching the back cushion to the back member of the seat body, said back cushion having a central section and a number of side sections pivotally mounted on the central section, the side sections being initially coplanar with the central section, the side sections being of buoyant material and the central section having a buoyancy less than that of the side sections, said attaching means including a release mechanism for each of the side sections respectively, each release mechanism having means to urge a respective side section out of the plane of the central section as the back cushion is separated from the back member of the seat body; and

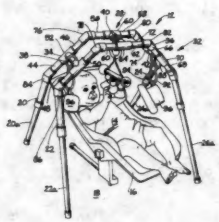
means coupled to the back cushion for removably securing the back cushion to a passenger sitting on the seat member.

4,627,588

INFANT ARTICLE SUSPENSION STRUCTURE

Richard M. Block, 1340 Custer St., Cincinnati, Ohio 45208

Filed Sep. 7, 1984, Ser. No. 648,659
Int. Cl.[4] F16M *13/32*
U.S. Cl. 248—163.2 **13 Claims**



1. A self-supporting structure for supporting one or more articles above an infant, comprising:

(a) a bridge structure spanning a predetermined horizontal distance, said bridge structure including a pair of rigidly interconnected parallel bar structures, each of said parallel bar structures having an arcuate configuration and being adapted for suspending one or more articles above a support surface, each of said parallel bar structures being formed by a series of longitudinally aligned pipe sections joined by interconnecting fittings;

(b) at least one suspension member hanging downwardly from said bridge structure for vertically supporting an article above the support surface in a predetermined relationship to an infant positioned substantially beneath said bridge structure; and

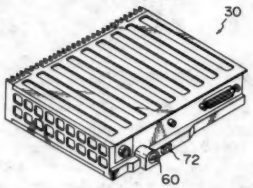
(c) support means extending from each horizontal end of said bridge to said support surface for supporting said bridge in a vertically elevated position above the support surface, said support means being in contact with the support surface only in the area about the horizontal ends of said bridge and leaving the area beneath said bridge unencumbered, whereby the support means does not interfere with placement of an infant beneath the bridge.

4,627,589

HOUSING FOR ELECTRONIC APPARATUS OR THE LIKE

Minoru Hotsumi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 29, 1984, Ser. No. 645,912
Claims priority, application Japan, Sep. 5, 1983, 58-137730[U]
Int. Cl.[4] A47B *91/00*
U.S. Cl. 248—346 **9 Claims**



1. An arrangement for accommodating and fixing an apparatus, comprising:

a housing for accommodating the apparatus therein, said housing having a first engaging member at one of opposite side walls thereof and a second engaging member at the other of said opposite side walls;

a space defining member for defining an elongate space along said other side wall of said housing and constituting part of said other side wall;

a slide plate disposed in said space to be slidable therealong;

a lock engaged with said slide plate to cause said slide plate into a sliding motion; and

housing mounting means for mounting the housing, said housing mounting means having a third engaging member engagable with the first engaging member, a fourth engaging member engagable with the second engaging member, and a fifth engaging member engagable with the slide plate in a predetermined position of the slide plate.

4,627,590

STOWAGE RECEIVER FOR FIXED LENGTH ROD

Daniel H. Zeorlin, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 3, 1984, Ser. No. 677,568
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—351 **7 Claims**

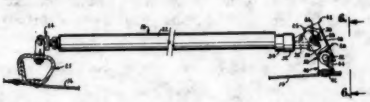
1. A bracket for releasably securing in standby position the free end of an elongated, rigid rod used to prop a swingable cover of an airplane engine cowl, said rod being mounted at one end to the cowl for swinging movement about a pivot point, said bracket comprising:

a support adapted to be mounted to the airplane in fixed position adjacent the free end of the rod when the latter is in said standby position;

an arm pivotally coupled to the support for swinging movement toward and away from said rod free end when the rod is in said standby position;

means carried by the arm and adapted to engage the rod free end for releasably securing the arm to the rod; and

spring means operably coupled with the support and with the arm for yieldably biasing the arm toward the rod, the arm being in disposition relative to the rod for exerting a



compressive force longitudinally of the rod under the influence of said spring means when the rod is engaged with the bracket at said standby position, whereby the rod and arm may be manually swung to respective positions of mutual engagement of the rod free end and said securing means for releasably securing the rod in the standby position with said compressive force exerted on the rod dampening any tendency of the rod to rattle during operation of the engine.

4,627,591

ADJUSTABLE LEGS FOR FURNITURE AND LOCKING MEANS FOR SECURING SUCH ADJUSTMENT

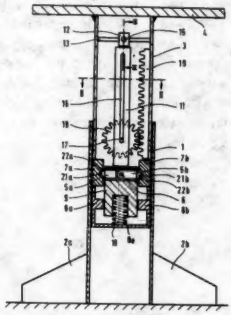
Peter Heckmann, Stangenstrasse 20, 7022 Leinfelden-Echterdingen, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 670,980

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341088

Int. Cl.⁴ F16M *11/00*

U.S. Cl. 248—411 **7 Claims**



1. In furniture of the type having leg means of adjustable height, said leg means comprising:

an outer leg segment having an inner surface,

an inner leg segment telescopingly received in said outer leg segment for vertical movement relative to said outer leg segment so that said inner leg segment is vertically adjustable,

locking means disposed within and carried by said inner leg segment for securing said inner leg segment in adjusted vertical relationships, said locking means comprising

first and second brake shoes mounted on said inner leg segment and arranged for movement transversely of a longitudinal axis of said inner leg segment to project through opening means in said inner leg segment,

a body carried by said inner leg segment for movement therewith,

first and second levers pivotably connected to said body by a horizontal pivot axle common to both said levers, said first and second levers being engageable with said first and second brake shoes, respectively, such that said first and second levers can be oriented horizontally to exert forces against respective ones of said first and second brake shoes in a direction oriented perpendicularly to said inner surface of said outer leg segment to press said brake shoes against said inner surface, said first and second levers being swingable relative to said inner leg segment and out of said horizontal orientation for shortening the effective transverse dimension of said levers to enable said brake shoes to be retracted away from said inner surface,

spring means for yieldably biasing said body toward a position in which said first and second levers are horizontally oriented to press said brake shoes against said inner surface, and

release means carried by said inner leg segment for displacing said body longitudinally against the bias of said spring means to move said levers out of said horizontally oriented position.

4,627,592

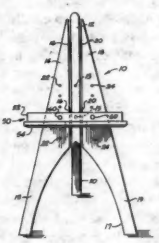
EASEL

Merriam B. Stillwell, Rte. 1, Six Mile, S.C. 29682

Filed Nov. 15, 1984, Ser. No. 671,558

Int. Cl.⁴ A47B *97/04*

U.S. Cl. 248—465 **16 Claims**



1. An improved, collapsible easel comprising:

(a) a body, said body comprising an elongated central member, a first side member hingedly secured along an edge of said elongated central member and a second side member hingedly secured along an opposite edge of said central member, said first and second side members being movable about said hinge connections between an operative position in which said side members and said central member are generally coplanar and a collapsed position in which said side members are turned rearwardly, generally transverse to said central member, said side members further having depending legs secured thereto;

(b) at least one rear leg pivotally secured at its upper end to said body, an opposite free end of said leg being movable away from said body and cooperating with said side member legs when in said operative position for support of said easel;

(c) means to secure said at least one rear leg when same is moved away from said body for support of said easel; and

(d) article receiving means securable in a generally horizontal disposition across said body in said operative position, said article receiving means and said body cooperating to support an article thereon.

4,627,593

PIPE SUPPORTS

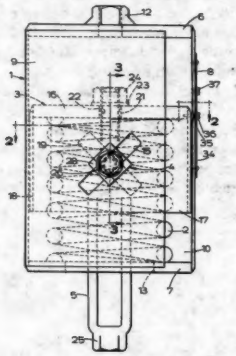
Anthony J. Salter, Cherry Trees, The Ridgeway, Sedgley, Dudley, West Midlands, DY3 1BS, England

Filed Oct. 31, 1984, Ser. No. 666,975

Claims priority, application United Kingdom, Nov. 5, 1983, 8329632

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—561 14 Claims



1. A pipe support comprising a body, spring means located by said body, a piston upon which said spring means acts and which is axially movable relative to said body, carrier means connected to said piston adapted to be engaged with a pipe to be supported, and locking means for locking said piston against movement relative to said body, said body having an axially extending part that has a first slot inclined with respect to the direction of movement of said piston, said piston comprising a crown plate which provides a seating for the spring means and an axially extending part which extends axially from the crown plate and which co-operates with said axially extending body part to guide said piston in its axial movement relative to said body, said axially extending piston part having adjacent to said axially extending body part a second slot which is oppositely inclined to said first slot, said first and second slots being so arranged as to have portions in register within the range of movement of said piston, and said locking means including clamping members interconnected through said registering portions of said slots and adapted to clamp said piston to said body part to retrain movement of said piston, said clamping members being releasable to allow said piston to move relative to said body.

4,627,594

MUDFLAP MOUNTING ASSEMBLY

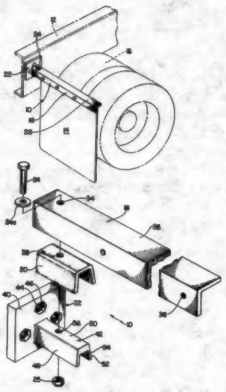
Jesse L. Reed, RD #1, Wendell Rd., New Salem, Mass. 01364

Filed Jun. 18, 1985, Ser. No. 746,255

Int. Cl.[4] B62D *25/16*

U.S. Cl. 248—632 5 Claims

1. A mounting assembly for mounting a mudflap on a vehicle comprising an elongated rigid bracket member adapted to receive a mudflap thereon, said bracket member having an inner end and having an inner surface comprising an upper surface portion and a pair of spaced side surface portions which extend downwardly therefrom and cooperate therewith to define a longitudinally extending channel in said bracket member, resilient pad means in said channel, a pedestal member comprising a mounting portion for mounting said pedestal member on said vehicle and an elongated pedestal element which extends from said mounting portion and has an outer pedestal element surface thereon, said outer pedestal element surface comprising an upper surface portion and a pair of spaced side surface portions which extend downwardly therefrom, said pedestal member being received in said channel so that said pad means is interposed between said pedestal element and said bracket member along the upper and side surface portions of said pedestal element outer surface and said bracket member inner surface, the upper surface portions of said pedestal element outer surface and said bracket member inner surface being dimensioned and configured to be received in substantially mating relation with said pad means therebetween, and means drawing the upper portions of said bracket member inner surface and said pedestal element outer surface together



so that said pad means is compressed therebetween, the side surface portions of said bracket member inner surface and said pedestal element outer surface and said pad means being constructed so that when the upper surface portions of said bracket member inner surface and said pedestal element outer surface are drawn together, said pad means is increasingly compressed between the side surface portions of said bracket member inner surface and said pedestal element outer surface in the downward extents thereof away from their respective upper surface portions.

4,627,595

ICE CONTAINER HAVING COILED STRIP PARTITION

Ronny Q. Rhodes, 16 Oakwood Ct., Tuscaloosa, Ala. 35402, and Jack W. Duke, 429 21st St., Suite 4, Tuscaloosa, Ala. 35401

Filed Mar. 7, 1985, Ser. No. 709,421

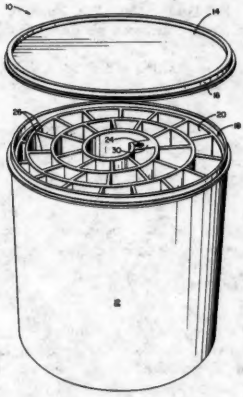
Int. Cl.[4] F25C *1/04, 1/24*

U.S. Cl. 249—121 12 Claims

12. An ice container comprising:

a vessel for holding water or ice cubes, said vessel having a central vertical axis; and at least one coiled strip positioned within said vessel, said coiled strip having a plurality of transverse ribs attached at intervals along the length of said strip, said coiled strip and transverse ribs being integrally

molded of polyethylene, said strip being in a generally horizontal position with the curvature of the coils of said strip



being generally concentric with the central vertical axis of said vessel.

4,627,596

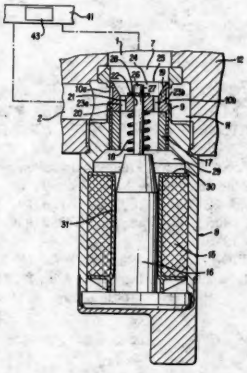
ELECTROMAGNETICALLY-CONTROLLED VALVE, SUITABLE FOR CONTROLLING AN ADDITIONAL AIR FLOW IN A FEED EQUIPMENT FOR AN INTERNAL COMBUSTION ENGINE

Pietro Busacchi, Bologna, Italy, assignor to Weber S.p.A., Torino, Italy

Continuation of Ser. No. 600,451, Apr. 16, 1984, abandoned. This application Oct. 7, 1985, Ser. No. 783,817

Int. Cl.[4] F16K *31/02*

U.S. Cl. 251—129.07 **4 Claims**



1. An electromagnetically controlled valve for controlling additional air flow delivered by feed equipment associated with an internal combustion engine, said feed equipment including at least an engine intake passage and a throttle valve disposed in said passage, said electromagnetically controlled valve comprising:

an air inlet for air coming from a first part of the intake passage, said air inlet being positioned upstream of said throttle valve;

an air outlet for air moving toward a second part of the intake passage, said air outlet being positioned downstream of the throttle valve;

a hollow tubular element connected to said air inlet and having primary connecting orifices between said air inlet and said air outlet;

a movable obturator housed within said tubular element, said obturator comprising a bushing of non-magnetic material and a magnetic keeper housed within said bushing, said obturator being slidable within said tubular element;

first and second stopping means for stopping movement of said obturator at limit positions within said tubular element;

magnetic field generating means for generating a magnetic field to move said obturator between said limit positions, said generating means including a core disposed in a winding energizable by electrical control means;

a return spring means for biasing said obturator against said magnetic field;

said first stopping means including a first support supported by said core;

said bushing including a second support for said spring, said second support being disposed in said bushing;

said bushing including secondary orifices to connect said air inlet with an internal part of said tubular element; and

said obturator including a conical edge means positioned to selectively open said primary connecting orifices responsive to energization of said winding to obtain laminar air flow across said primary connecting orifices, said laminar air flow being directly proportional to an air passage section provided by said primary connecting orifices.

4,627,597

VALVE ACTIVATION APPARATUS

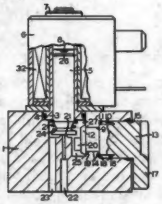
Walter Brausfeld, Hanover; Helmut Göttling, Isernhagen; Rudolf Möller, Gehrden; Peter Müller, Hanover, and Gerhard Scharnowski, Gehrden, all of Fed. Rep. of Germany, assignors to Wabco Westinghouse Steuerungstechnik GmbH & Co., Hanover, Fed. Rep. of Germany

Filed Dec. 17, 1985, Ser. No. 810,007

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446410

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.03 **13 Claims**



1. Activation apparatus for operating, under emergency and manual conditions, an electromagnetically-controlled multiway valve, having at least one inlet and one outlet port, and at least one valve arrangement disposed therebetween, and all formed in a valve housing, said activation apparatus comprising:

(a) an activation member disposed in a housing recess formed in the valve housing, said activation member extending at least partially into a pressure chamber in which the at least one valve arrangement is disposed;

(b) sealing means connected to said activation member for sealing said activation member against said housing recess;

(c) holding means partially formed in said housing recess, and interacting with said activation member for holding said activation member in an engageable position with said housing recess, said holding means including first and

second stop surfaces formed on said activation member, which interact with at least one complementary stop surface, formed in said housing recess, so as to limit movement of said activation member in the direction of the longitudinal axis of said housing recess;

(d) at least one of said first and second stop surfaces formed on said activation member being elastically-deformable such that, upon introduction of said activation element into said housing recess, said activation member can be guided past said complementary stop surface and, once past said complementary stop surface, said elastically-deformable at least one stop surface can resume its original shape and interact with said complementary stop surface in the manner of a snap-connection;

(e) said first and second stop surfaces and said sealing means being permanently affixed to said activation member to form essentially a single-piece component; and

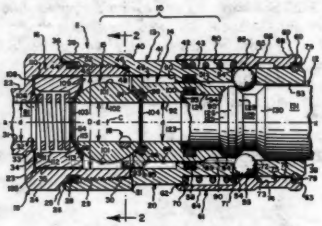
(f) valve moving means formed on a portion of said activation member, extending into said pressure chamber, for moving a valve body portion of the at least one valve arrangement when the electromagnetically-controlled multiway valve is operating under such emergency and manual conditions.

4,627,598

COUPLING DEVICE WITH ECCENTRICALLY-MOUNTED ROTARY VALVE ELEMENT

Raoul Fremy, Villa Emilia, 17 Rue Cecile Vallet, 92340 Bourg La Reine, France

Filed Jan. 31, 1986, Ser. No. 824,433
Int. Cl.[4] F16L *37/28*
U.S. Cl. 251—149.2 **15 Claims**



1. A coupling device section, comprising:

an elongated tubular housing having a flow passage therethrough, said flow passage having a conduit portion and having an enlarged chamber, said housing also having an abutment surface arranged to face into said chamber;

an annular seat member arranged within said chamber for sliding movement therealong toward and away from said abutment surface, the inner surface of said seat member having a diameter substantially equal to the diameter of said conduit portion;

a rotary valve element having a center and arranged within said chamber, said valve element having an outer surface continuously in engagement with said seat member and having a through-bore arranged such that the axis of said through-bore intersects said valve element center;

biasing means continuously urging said valve element and seat member to move toward said abutment surface; and

pivot means operatively arranged between said housing and said valve element for causing said valve element to rotate about a pivotal axis transverse and eccentric to said bore axis as said valve element moves along said chamber;

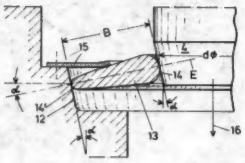
whereby, as said valve element moves along said housing, said valve element will be caused to rotate about said pivotal axis between a flow-preventing position and a flow-permitting position.

4,627,599

SEALING MECHANISM FOR HIGH VACUUM VALVE

Gerhard Ehmig, Rankweil-Brederis, Austria, assignor to Siegfried Schertler, Haag, Switzerland

Filed Dec. 9, 1985, Ser. No. 806,790
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445236
Int. Cl.[4] F16K *1/38, 1/42*
U.S. Cl. 251—334 **4 Claims**



1. A sealing mechanism for a high vacuum valve device including a movable member having a longitudinal axis and movable in the direction of said axis for opening and closing said valve device comprising:

a first sealing surface designed as a surface of revolution;

a second sealing surface also designed as a surface of revolution arranged coaxially relative to said axis with said first surface;

one of said first and second sealing surfaces being formed on said movable member, said sealing surfaces being movable relative to each other in the direction of said axis by movement of said movable member and being located spaced from each other in the closed position of said valve device; and

a solid sealing member configured as a conical annular disk arranged between said first and second sealing surfaces adapted to bridge the space therebetween, said solid sealing member being formed with rounded edges on opposite sides thereof, said rounded edges being located to engage and roll off against said first and second sealing surfaces respectively during the process of closing said valve device;

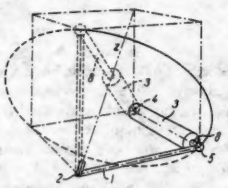
said rounded edges being formed with different radii of curvature.

4,627,600

MECHANISM TO BE MOUNTED BETWEEN TWO PARTS, WHOSE MUTUAL DISTANCE MUST BE VARIABLE

Eskild Pontoppidan, Lyngby, Denmark, assignor to Flemming HVIDT Mobelarkitektfirma A/S, Denmark

PCT No. PCT/DK84/00100, § 371 Date Jun. 14, 1985, § 102(e) Date Jun. 14, 1985, PCT Pub. No. WO85/01645, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 16, 1984, Ser. No. 749,625
Claims priority, application Denmark, Oct. 17, 1983, 4784/83
Int. Cl.[4] B66F *3/00*
U.S. Cl. 254—124 **6 Claims**



1. Mechanism to be mounted between two parts, whose mutual distance must be variable, preferably against a load, e.g.

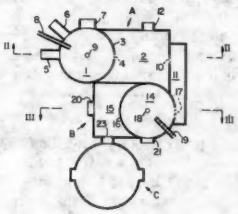
the bottom and the frame of a bed, which mechanism has a bar (1) pivotally journalled in a bearing (2) and connected with one of the parts of one end, the bar also being coupled with a pivotally suspended (4) driving means (3,8) wherein the driving means (3,8) actuates the bar (1) substantially transverse to its longitudinal direction, and wherein the axis of the bearing (2) of the bar (1) extends obliquely in relation to a plane containing the connecting line between a suspension point (4) of the driving means (3,8) and its point of application on the bar (1).

4,627,601

INSTALLATION FOR THE PRODUCTION OF STEEL BY PRE-SMELTING OF PIG IRON

Aristide Berthet, and Guy Denier, both of Metz, France, assignors to IRSID, Maizieres-les-Metz, France

Filed Jun. 24, 1985, Ser. No. 748,118
Claims priority, application France, Jun. 22, 1984, 84 09819
Int. Cl.[4] C21C 1/00
U.S. Cl. 266—212 8 Claims



1. Installation for the production of steel by pre-smelting of pig iron comprising a stage of desilication and of dephosphorization followed by a decarburization stage, wherein said desilication and dephosphorization stage is constituted by at least one closed unit comprising

(a) a first reactor (1) in which the pig iron to be pre-smelted forms a bath whose surface is maintained at a first predetermined level (N_1), said reactor having

(i) an upper part above said first predetermined level (N_1), provided with means (5) for introducing the pig iron to be pre-smelted, means (6) for introducing agents for oxidizing silicon and phosphorus, agents for forming a desilication and dephosphorization slag, and means (8) for creating an oxidizing atmosphere above said bath; and

(ii) a lower part, below said first predetermined level (N_1), provided with means (9) for stirring of the metallic bath; and

(b) a decanter (2) separated from said first reactor (1) by a partition (3) comprising a communication opening (4) below said first predetermined level (N_1) and whose free upper end, extending above said first predetermined level (N_1) constitutes a sill encircling the slag formed in the reactor, this decanter comprising

(i) an outlet opening (10) located below said first predetermined level (N_1) and communicating with a connecting conduit (11) to permit the circulation of a flow of desilicated and dephosphorized pig iron toward said decarburization stage; and

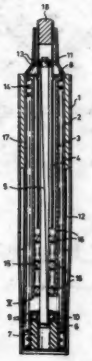
(ii) an overflow (12) located above said first predetermined level (N_1) for evacuating the decanted desilication and dephosphorization slag coming from said first reactor (1) to the exterior.

4,627,602

MECHANICAL LIFTING DEVICE

Claus L. Sporck, Cedar, Mich., assignor to Hag A/S, Oslo, Norway

Filed May 31, 1985, Ser. No. 739,998
Claims priority, application Norway, Jun. 5, 1984, 842262
Int. Cl.[4] F16F 1/00; A47C 3/24
U.S. Cl. 267—182 9 Claims



1. A mechanical lifting device adapted for use with a chair having a chair seat and a supporting chair subframe, which comprises:

an exterior tube, and an elevating tube mounted at least partially internally of the exterior tube, the exterior tube and elevating tube being movable mutually telescopically, one of the tubes being joined to the chair seat, and the other of the tubes being joined to the chair sub-frame;

an outer locking tube mounted to the elevating tube and disposed therein;

a hollow pressure rod coaxially surrounded by the outer locking tube;

an elongated locking screw at least partially received by the hollow pressure rod, the screw being mounted at one end to the exterior tube and pivotal about the longitudinal axis of the exterior tube, the locking screw having formed on its outer surface a thread of a predetermined pitch; and

threaded nut means having an adjustable thread pitch and being adapted for selectively preventing pivotal movement of the elongated screw, the nut means being spring biased to be expandable and compressible in the longitudinal direction of the outer locking tube, the nut means including a plurality of spring biased threaded locking nuts arranged longitudinally with respect to the locking tube, and biasing spring means positioned between adjacent nuts, each locking nut having an individual thread pitch corresponding to the thread pitch of the elongated screw, each nut of the nut means engaging the screw, and engaging the outer locking tube so as to be non-rotatable with respect to the locking tube, the nut means being adapted to be compressed to a first state and expanded to a second state so that the distance between adjacent nuts is adjustable to be greater or less, respectively, wherein, when the nut means is in the first state, the thread pitch of the nut means is substantially different from that of the elongated screw to prevent the elongated screw from pivoting and when the nut means is in the second state, the threaded pitch of the nut means is substantially the same as that of the elongated screw to allow the screw to pivot.

4,627,603
CLAMPING DEVICE

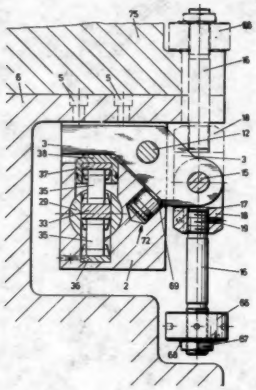
Bernhard Stahl, Neunkirchen, and Horst Böhm, Siegen, both of Fed. Rep. of Germany, assignors to Optima Spanntechnik GmbH, Siegen, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,301

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1984, 3425275

Int. Cl.[4] B66F *3/00*

U.S. Cl. 269—32 **13 Claims**



1. In a clamping device for clamping a workpiece in position, said clamping device including a main housing, a clamping piston slidable in said housing, means for subjecting said clamping piston to fluid under pressure, a sliding member, means transversely slidably mounting said sliding member in said clamping piston, toggle members co-operating with said sliding member, saddle bearings at the sides of said main housing, said toggle levers extending between said sliding member and said saddle bearings on both sides of said sliding member, each of said toggle levers being movable by said clamping piston between a position inclined to the axis of movement of said clamping piston and an extended position, a clamping anchor, means mounting said clamping anchor on said housing and means for loading said clamping anchor from said toggle levers, the improvement comprising a clamping lever, means mounting said clamping lever to pivot about an axis in said main housing, means slidably guiding one end of said clamping lever in said main housing, means movably mounting one of said saddle bearings in said main housing for movment by one of said toggle levers, said movably mounted saddle bearing acting upon said one end of said clamping lever, and pivot means pivotally mounting said clamping anchor on the other end of said clamping lever for pivotal movement through an angle of up to 180° from a release position into a clamping position, said other end of said clamping lever projecting from said main housing.

4,627,604
ADJUSTABLE CLAMP

Sang B. Choi, 8709 Old Mt. Vernon Rd., Alexandria, Va. 22309

Filed Apr. 11, 1985, Ser. No. 722,201

Int. Cl.[4] B25B *1/02*

U.S. Cl. 269—214 **12 Claims**

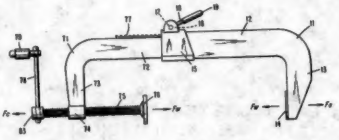
1. An adjustable clamp for clamping a workpiece to another object, comprising:

a generally L-shaped first end piece, having a substantially hollow first arm of predetermined internal cross section and, attached to said first arm, a second arm provided with a gripping surface;

a first hollow intermediate extension piece, of uniform internal cross section, shaped and sized to fit in close controlled insertion at a first end inside said hollow first arm of said first end piece;

a generally L-shaped second end piece having a third arm shaped and sized to fit in close controlled insertion inside a second end of said hollow intermediate extension piece and, attached to said third arm, a fourth arm having an internally threaded boss at its unattached end;

a threaded screw inserted into said threaded boss, rotatably moveable therewithin toward said gripping surface to provide a clamping action on said workpiece positioned



therebetween, said threaded screw having a gripping element at its end nearest said workpiece;

first locking means for positively locking said first intermediate extension piece in a predetermined juxtaposition with respect to and inside said hollow first arm with said first end of said first intermediate extension piece inserted therein; and

second locking means for positively locking said third arm in a predetermined juxtaposition with respect to and inside said second end of said first intermediate extension piece.

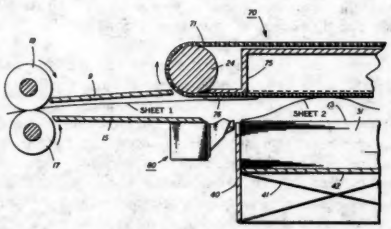
4,627,605
FRONT AIR KNIFE TOP VACUUM CORRUGATION FEEDER

George J. Roller, Penfield, and Kendolph A. Thomas, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 6, 1985, Ser. No. 795,593

Int. Cl.[4] B65H *3/12*

U.S. Cl. 271—94 **10 Claims**



1. A high speed top sheet separator-feeder for separating and forwarding sheets including flimsy sheets and downcurled sheets seriatim from the top of a stack of sheets, comprising a stack tray for supporting a stack of sheets to be fed, endless perforated vacuum belt means extending from a position above a portion of the sheet stack tray to at least the front end of the sheet stack tray for acquiring and advancing the top sheet of the stack, said vacuum belt means including a roughened surface to increase the coupling between a sheet and said vacuum belt means and extending across a support surface having vacuum ports therein for positioning a negative pressure at the back of said vacuum belt means and a corrugation means located on one surface of said support surface that is adapted to corrugate a sheet drawn thereto due to the actuation of said negative pressure so that any sheets initially adhering to the top sheet in the stack of sheets will break away from the top sheet and fall back onto the sheet stack, air knife means positioned in front of the stack tray for applying air pressure to the

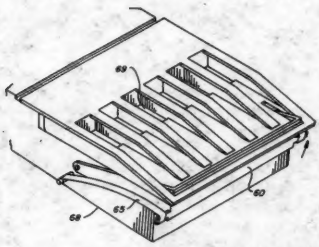
sheets in the stack tray to separate the top sheet from the next adjacent sheet, said air knife means including separation jets and a converging slot jet for separating the top sheet in the stack from the rest of the stack and vectored auxiliary separation jets for assisting in separating downcurled sheets, vacuum means for applying a continuous and uniform negative pressure to said vacuum ports during the feeding of sheets from the stack tray in order to increase the throughput of said separator-feeder, and gate means adapted to prevent multifeeds from said stack tray.

4,627,606

BOTTOM SHEET FEEDING APPARATUS EMPLOYING A COMBINATION SLIDE PLATE AND VACUUM VALVE

Kenneth P. Moore, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 13, 1984, Ser. No. 681,415
Int. Cl.[4] B65H *3/08*
U.S. Cl. 271—98 2 Claims



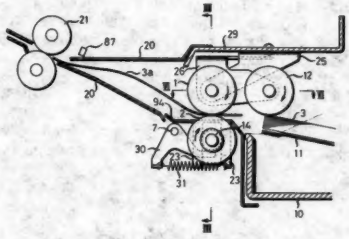
1. A bottom sheet separator-feeder for separating and forwarding sheets seriatim from the bottom of a stack of sheets to be fed, comprising a stack tray for supporting the sheets to be fed, air knife means positioned in front of the stack tray and adapted to provide a layer of air between said tray and the bottom sheet in the stack and the remainder of the sheets in the stack, and vacuum feeding means located within the front portion and in line with the top surface of said tray, said feeding means including a slide plate member having a first surface portion extending along the plane of the bottom surface of said tray and a second surface portion that is sloped down and away from said first surface portion and said tray and extending the width of said tray for bending the front portion of the bottom sheet in the stack down and away from the remainder of the stack, said slide plate member having a plurality of sheet hold down slots in said first and second surface portions and a vacuum plenum arranged for communication with said sheet hold down slots to attract the bottommost sheet in the stack to said slide plate member, said vacuum plenum remaining stationary while said slide plate member is reciprocated to move sheets from under said stack to a take-away position, and including a two position wall connected to said vacuum plenum and positioned with respect to a forward end of said vacuum plenum for blocking air knife flow to the stack during initial sheet acquisition when in a first of said two positions while simultaneously facilitating a higher and faster negative pressure rise below the stack and for allowing full air knife flow to the stack when in the second of said two positions.

4,627,607

SHEET FEEDING SYSTEM

Yasuaki Ishii, Ichikawa, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Oct. 13, 1983, Ser. No. 541,376
Claims priority, application Japan, Oct. 15, 1982, 57-155225[U]; Oct. 15, 1982, 57-179782; Oct. 16, 1982, 57-180559; Feb. 10, 1983, 58-17444[U]
Int. Cl.[4] B65H *3/06*
U.S. Cl. 271—122 9 Claims



1. A sheet feeding system of the frictional sheet separation roller type comprising:

(a) a feed roller rotatable about its axis to feed a sheet in a sheet feeding direction;

(b) a separation roller opposing said feed roller and rotatable opposite to the sheet feeding direction;

(c) a separation roller shaft supporting said separation roller at one free end thereof and pivotably supported at its other end in a pivot;

(d) biasing means for exerting a first pressing force on said shaft between said separation roller and said pivot to press said separation roller against said feed roller, and guiding means for guiding said shaft under said pressing force to be pivotable toward said feed roller in a plane including its own axis and the axis of said feed roller;

(e) a driven gear mounted on said separation roller shaft between said pivot and said separation roller, and a drive gear in mesh therewith for rotating said separation roller shaft in the direction opposite to the sheet feeding direction, said driven gear by engagement with said drive gear applying a second pressing force by a torque on said separation roller shaft; and

(f) a torque limiter mounted on said separation roller shaft between said driven gear and said separation roller, said torque limiter having the torque on said separation roller shaft applied thereto and transmitting a selected torque to said separation roller to provide a sheet returning force,

whereby a pressing force of said separation roller against said feed roller can be determined by the relation of the positions of the driven gear, biasing means, and separation roller from said pivot, and by said first and second pressing forces, and said sheet returning force is provided by the torque transmitted by said torque limiter from said second pressing force.

4,627,608

VACUUM TAKE-OFF CONVEYOR

Jeffrey W. Harms, Olathe, Kans., assignor to Gill Studios, Inc., Shawnee Mission, Kans.

Filed May 1, 1985, Ser. No. 729,283
Int. Cl.[4] B65H *3/12*
U.S. Cl. 271—197 8 Claims

1. A vacuum take-off conveyor for transferring a printed sheet from the discharge end of a delivery conveyor to a sheet stacking apparatus, said vacuum take-off conveyor comprising:

(a) a vacuum chamber structure having side walls and top and bottom walls and defining a vacuum chamber there-

within; said side walls having respective first and second ends;

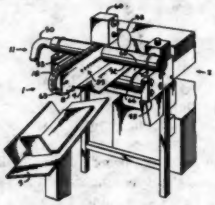
(b) a drive pulley associated with said side wall first ends and rotatable on an axis transverse to said side walls;

(c) adjustable motive means for rotating said drive pulley about said drive pulley axis at different rotational speeds;

(d) an idler pulley associated with said side wall second ends and rotatable on an axis transverse to said side walls;

(e) an endless foraminous belt having a multiplicity of apertures extending along a length of said belt; said belt being received on said chamber structure so as to run as a loop around said drive pulley and said idler pulley and along said top and bottom walls; said belt being engaged by said drive pulley so as to be responsive to rotation of said drive pulley, whereby said belt generally moves in a continuous loop between said first and second ends along said bottom wall and away from said delivery conveyor and toward said sheet stacking apparatus;

(f) vacuum means for creating a lower air pressure within said vacuum chamber than in the surrounding atmosphere;



(g) air communication means along said vacuum chamber bottom wall to allow air to flow from the surrounding atmosphere through said belt apertures and into said vacuum chamber, whereby a suction is created along a portion of said belt traveling along said air communication means;

(h) damping means situated within said vacuum chamber; said damping means separating said vacuum chamber into a high vacuum region and a low vacuum region, said high vacuum region being situated in close proximity and above said delivery conveyor discharge end such that a sheet on said delivery conveyor is delivered beneath and adjacent the high vacuum region of said vacuum chamber and is sucked upwardly against said belt and moved toward said low vacuum region where it adheres to said belt with lesser force to facilitate discharge from beneath said belt onto said sheet stacking apparatus; and

(i) said damping means including a plate adjustably extending generally between said top and bottom walls and defining a space therebetween for adjustably modifying air flow communication between said high and low vacuum regions.

4,627,609

SHEET DELIVERY DEVICE, ESPECIALLY FOR SMALL OFFSET PRINTING MACHINE

Gottfried Höfer, Mauer, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

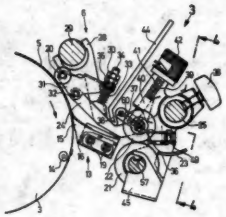
Filed Apr. 15, 1985, Ser. No. 723,091

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3413943

Int. Cl.[4] B65H *29/54*

U.S. Cl. 271—311 **9 Claims**

1. Sheet delivery device for a printing machine wherein a sheet is peeled from an impression cylinder and introduced into a nip formed between two conveyor rollers rolling on one another, comprising a sheet guiding device located downstream of the conveyor rollers in travel direction of a peeled sheet, guide rollers for a trailing region of the peeled sheet, said guide rollers being in operative engagement with the impression cylinder, a carrying element carrying and uniting the conveyor rollers, said sheet guiding device and said guide rollers into a single unit so that they are adjustable in common therewith to a selected format width, adjusting means carried by said carrying element for adjusting respective forces of application of the conveyor rollers and said guide rollers and including another carrying element, a respective one of said guide rollers, and one of the two conveyor rollers acting as an application roller being arranged on each of said carrying elements, one of said carrying elements being disposed at a location adjacent the left-hand side of the sheet and the other of said carrying elements being disposed at a location adjacent the right-hand side of the sheet, said carrying elements being mounted laterally slidable and lockable on cross bars extending



across the width of the printing machine, the other of said two conveyor rollers cooperating with said one conveyor roller acting as an application roller and being mounted axially displaceably on a drive shaft likewise extending across the width of the printing machine, said other conveyor roller being in entraining connection with said carrying element, and including adjusting means engaging said carrying element for adjusting and displacing said bracket relative to said carrying element in a direction as viewed across the width of the printing machine, said adjusting means comprising knurled nuts engaging a strap of a bracket forming said entraining connection for laterally adjusting said bracket and thus said other conveyor roller with respect to said guide roller and said one conveyor roller arranged on said carrying element, said knurled nuts being screwed onto a threaded pin engaging in a threaded bore formed in said carrying element.

4,627,610

MULTI-PURPOSE EXERCISING APPARATUS

Hiroshi Ishida, La Mirada, Calif., and Yujen Wang, Tainan, Taiwan, assignors to Rocket Industries, Inc., Pico Rivera, Calif.

Filed Apr. 1, 1985, Ser. No. 718,153

Int. Cl.[4] A63B *69/06, 21/00*

U.S. Cl. 272—72 **14 Claims**

1. A multi-purpose exercising apparatus for selective usage as a rowing machine or for performing other types of exercises such as a bench press, comprising:

a generally horizontal base frame having opposed sides and a forward end and a rearward end;

a longitudinally-extending track on said frame;

a seat mounted on said track for longitudinal movement relative to said frame;

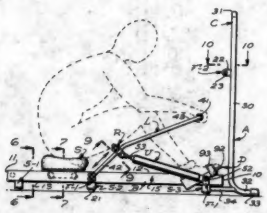
at least one movable lever member having the inner end thereof connectable to said frame by releasable attachment means for pivotal movement relative to said frame and containing handle means at the other end thereof to be grasped and moved by a user's hand;

elongate resistent means having one end thereof operatively

connected to said lever member providing resistence to the pivotal movement of said lever member, the other end of said resistence member being connected to the frame;

foot bracing means mounted on the frame for bracing the user's feet during use of the apparatus as a rowing machine;

a vertically extending column member attached to the base frame adjacent the forward end thereof; and



attachment means on said column member for receiving and releasably connecting the inner end of the lever member to said column member for pivotal movement relative thereto when said inner member is not connected to the base frame, thereby providing means for performing exercises not available using a rowing machine.

4,627,611

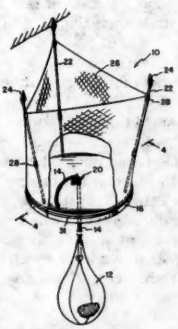
IMPACT TRAINING DEVICE

Stephen R. Kauffman, 2650 N. Miracle Mile, Apartment 819, Tucson, Ariz. 85705

Filed Sep. 12, 1984, Ser. No. 649,728

Int. Cl.[4] A63B *69/00*

U.S. Cl. 272—77 **13 Claims**



1. An impact training device, comprising:

a bag commensurate in size with the human hand and foot,

a flexible and resilient cord member connected at its lower end to said bag,

a board member approximately twice the size of the bag,

said cord member having an upper end portion adjustably connected to said board member to vary the position of said bag relative to said board member,

a flexible net member having a lower end portion surrounding and connected to said board member, said net member extending upwardly from said board member a sufficient distance to be engaged by said bag when it is struck and moves upwardly, and

said net member having a mounting means secured to said board member for connecting it to a support; whereby said cord member is lengthwise adjustable to vary the distance between said bag and said board member or said net member.

4,627,612

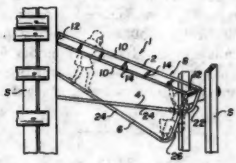
OVERHEAD CLIMBER

Roger D. Gehlbach, 4321 John St., Vancouver, British Columbia, Canada V5V 3W8

Filed Feb. 22, 1985, Ser. No. 704,481

Int. Cl.[4] A63B *9/00*

U.S. Cl. 272—113 **7 Claims**



1. A play device comprising:

a pair of longitudinal members, each member having a first end and a second end;

a plurality of cross members joining the longitudinal members;

a first member attached to one longitudinal member at each end of the longitudinal member by different length limbs and including a straight support section joining the limbs, the support section extending in a gradual, uniform slope, relative to the longitudinal member;

a second member attached to the other longitudinal member at each end of the longitudinal member by different length limbs and including a straight support section joining the limbs, the support section extending in a gradual, uniform slope, relative to the longitudinal member;

the first support member having its longer limb at that end of the play device where the second member has its shorter limb; and

locating means for the play device.

4,627,613

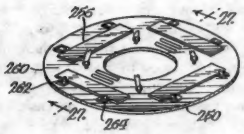
HYDRODYNAMIC JUMPER

Daniel S. Solloway, 1315 18th St., Woodward, Okla. 73801

Continuation-in-part of Ser. No. 411,853, Aug. 26, 1982, Pat. No. 4,458,896, which is a continuation-in-part of Ser. No. 310,788, Oct. 13, 1981, Pat. No. 4,416,451, which is a continuation-in-part of Ser. No. 79,966, Sep. 28, 1979, Pat. No. 4,311,306. This application Jun. 25, 1984, Ser. No. 624,123

Int. Cl.[4] A63B *21/20*

U.S. Cl. 272—116 **9 Claims**



1. A jumper aquatic exercise assembly for use in repetitively squatting and doing knee bends underwater to strengthen muscles and improve muscle tone in the user's legs, comprising:

a substantially rigid annular hydrodynamic member extending substantially continuously and laterally away from and about the waist of the user defining a waist-receiving

opening, said annular member having a substantially rigid annular, downwardly facing surface descendingly engaging the water and creating substantial hydrodynamic fluid resistance and a downward pressure head when said annular member is lowered in the water and a substantially rigid annular, upwardly facing surface for ascendingly engaging the water and creating hydrodynamic fluid resistance and an upward pressure head when said rigid member is raised in the water;

flexible strap means operatively connected to said annular member for supporting said annular member from the user's shoulders generally about the waist of the user; and

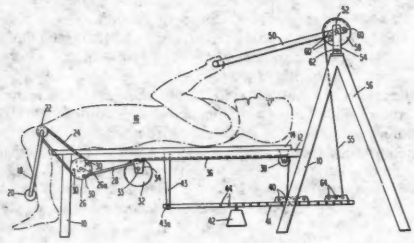
substantially rigid fluid resistance enhancing means positioned symmetrically about and extending integrally from said rigid annular hydrodynamic member for increasing the hydrodynamic fluid resistance and pressure head of said rigid annular member when said rigid annular member is raised in the water.

4,627,614

EXERCISE APPARATUS

Michael M. de Angeli, 225 Church St., Philadelphia, Pa. 19106

Division of Ser. No. 160,614, Jun. 18, 1980, Pat. No. 4,422,636.
This application Dec. 19, 1983, Ser. No. 563,161
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—117 **9 Claims**



1. Apparatus for the exercise of an athlete's legs by lifting weight against the force of gravity, comprising:

a frame;

a weight;

a bench mounted on said frame;

a single arm mounted on said frame for being rotated about a first generally horizontal axis upon exertion of force thereon by an athlete;

a drum mounted on said frame for rotation about a second axis;

means connecting said single arm to said drum for transmitting force therebetween, such that said drum is rotated upon rotation of said arm about its axis; and

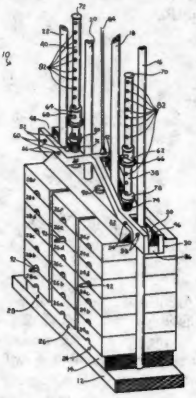
a flexible tension member connected to said drum to be wound onto said drum upon rotation thereof, said tension member being connected to said weight to lift and lower the same when said single arm is rotated, wherein said means connecting said single arm and said drum includes means for permitting the athlete to select which of two possible directions of rotation of said arm about said first axis will rotate said drum to wind said tension member thereupon so as to lift said weight in response to movement of said arm in either selected direction in perfomance of a given exercise, and to permit the point at which rotation of said arm from a rest position causes commencement of lifting of said weight from a rest position to be varied independent of the distance through which said weight is lifted by rotation of said arm through a given degree of rotation.

4,627,615

PROGRESSIVE WEIGHT RESISTANCE WEIGHTLIFTING MECHANISM

Paul S. Nurkowski, 50 Goodwin Parkway, Sewell, N.J. 08080

Filed Nov. 13, 1984, Ser. No. 670,091
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 **14 Claims**



1. Progressive resistance mechanism for a weight-lifting machine comprising:

(a) a base;

(b) a plurality of spaced vertical guide members upstanding from the base;

(c) a carriage adapted for vertically reciprocative motion along said vertical guide members;

(d) a plurality of weight stacks on said base beneath the carriage, each stack including a plurality of stacked weights;

(e) an upright vertically movable selector post for each stack extending from below the lowermost weight of the stack to above the carriage;

(f) means for connecting the lowermost weight of a selected number of weights to said post; and

(g) carriage engaging means on said post above the carriage for engagement by said carriage on upward movement of said carriage, the carriage engaging means on at least one post being vertically adjustable with respect to said post, the independent adjustment of the carriage engaging means on said post resulting in selected progressive sequential weight resistance during a single user repetition.

4,627,616

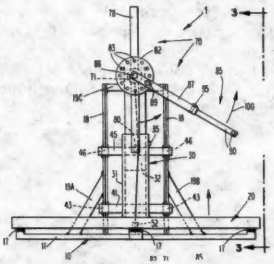
EXERCISE APPARATUS

Brad Kauffman, 35 Back Cove Estates, Portland, Me. 04103

Filed Jul. 9, 1985, Ser. No. 753,321
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—120 **10 Claims**

1. An exercising machine comprising: stationary frame means including track means; platform means movably engaging said track means; cable means for moving said platform means along said track means in response to an external force; lever means mounted to said platform means for producing means against which said external force may be applied and for

permitting engagement with said cable means at various locations to vary the amount of said external force required to be



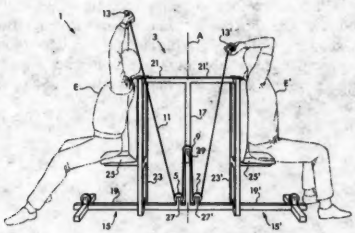
applied to said lever means to move said platform means in relation to said stationary frame means.

4,627,617

EXERCISE DEVICE WITH OPPONENT SUPPLIED RESISTANCE

Douglas D. Gilmore, 501 Lookout Mtn Rd., Golden, Colo. 80401, and G. Michael Harz, Golden, Colo., assignors to Douglas D. Gilmore, Lakewood, Colo.

Filed Jun. 3, 1985, Ser. No. 740,834
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—120 **15 Claims**



1. An exercise device primarily intended for use by two individuals working against one another to provide the resistance to movement of the other rather than working alone against dead weight, said exercise device including:

a flexible cable member having first and second end portions,

first and second user engaging members and means for attaching said first user engaging member to the first end portion of said cable member and means for attaching said second user engaging member to the second end portion of said cable member, and

a frame having first and second side portions, said first and second side portions extending away from each other relative to a vertical plane centrally located relative to said frame, first and second seat members and means for respectively mounting said seat members to the first and second side portions of said frame on opposite sides of the central, vertical plane of said frame with said seat members facing in opposite directions, and first and second pulley members, and means for mounting said first pulley member to the first side portion of said frame for rotation about a first, horizontal axis and means for mounting said second pulley member to the second side portion of said frame for rotation about a second, horizontal axis wherein said cable member is run through said frame from one side portion to the other side portion with said cable member being received partially about the respective pulley members below the respective horizontal, rotational axes thereof whereby the two individuals can sit on respective ones of said seat members, grip a respective one of said user engaging members, and continuously apply an upward force thereto with each individual alternately applying a greater upward force than the other to alternately draw the cable member through the frame toward him while the other individual resists such movement wherein the two individuals always hold the same muscles in tension while exercising on the device

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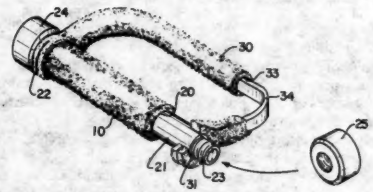
4,627,618

AEROBIC HAND WEIGHTS

Leonard Schwartz, 5526 Northumberland St., Pittsburgh, Pa. 15217

Continuation-in-part of Ser. No. 413,807, Sep. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 127,474, Mar. 5, 1980, Pat. No. 4,351,526. This application Feb. 28, 1983, Ser. No. 470,621
Int. Cl.[4] A63B *11/00*
U.S. Cl. 272—122 **11 Claims**



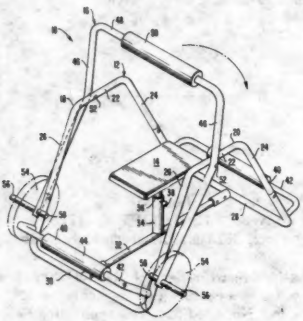
1. A hand weight structure particularly adapted for aerobic and related extended-time exercises comprising an elongate rapid body member of sufficient weight for use in aerobic exercise having a surrounding soft, resilient central hand portion, where the ends of said body member extend from said central hand portion, a rigid three sided member adapted to overlay the back and sides of a hand, and a soft resilient hand engaging means surrounding said three sided member and engaging the ends of said body member at each side of said central hand portion, said hand engaging means having sufficient resilience so as to urge said rigid member toward said elongated body member thus engaging the hand between the three sided member and body member in a soft, frictional engagement.

5. A hand weight for aerobic and similar extended time exercises comprising a generally cylindrical elongate hand portion including an elongate weight body member and an elongate hollow resilient foam hand grip member slidably receiving the elongate weight body member where the ends of said elongated weight body member extend from said hand grip member, a hollow resilient foam hand engaging means engaged at each end on said ends of the elongate weight body member, and a generally C-shaped rigid member within said hollow hand engaging member and spaced from the elongate weight body member, said hand engaging member having sufficient resilience so as to urge said rigid member toward said elongated weight body member thus engaging the hand between the C-shaped rigid member and the elongated weight body member in a frictional engagement.

4,627,619
ABDOMINAL AND BACK WEIGHT TYPE EXERCISING DEVICE

Gary Rockwell, LaGrange, Ga., and Randall Bartlett, Opelika, Ala., assignors to Diversified Products Corporation, Opelika, Ala.

Filed Jan. 31, 1985, Ser. No. 696,705
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 5 Claims



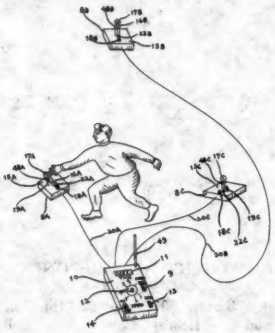
1. An abdominal/back exerciser comprising:
a frame having spaced side members;
a seat attached to said frame between said frame side members;
foot bracing means between said frame side members on each side of said seat;
a generally U-shaped lever assembly having parallel side legs pivoted intermediate their length to said frame side members about a pivot axis, and a padded torso-engaging member interconnecting said side legs;
weight mounting means at the distal end of each of said side legs for mounting selected weights; and
stop means extending laterally between said side legs of said lever assembly and said side members of said frame for limiting downward movement of said side legs to a start position, said torso-engaging member being elevated above said seat in said start position so that a user seated on said seat facing said torso-engaging member may exercise the user's abdominal muscles by leaning forwardly against said torso-engaging member to rotate said lever assembly and raise said weight and so that a user seated on said seat with the user's back to said torso-engaging member may exercise the user's lower back muscles by leaning backwardly against said torso-engaging member to rotate said lever assembly and raise said weight.

4,627,620
ELECTRONIC ATHLETE TRAINER FOR IMPROVING SKILLS IN REFLEX, SPEED AND ACCURACY

John P. Yang, 59 Royce Brook Rd., Belle Mead, N.J. 08502

Filed Dec. 26, 1984, Ser. No. 686,467
Int. Cl.[4] A63B *71/02, 71/06*
U.S. Cl. 273—1 GC 2 Claims

1. A training apparatus comprising in combination multiple targets which are to be placed around the player with different distances and heights; an electronic device having electronic components for controlling the operation of said training apparatus; means for randomly selecting said targets; sound generator means acting as a coordinating means to coordinate the hearing, vision and body control of the player, responsive to said target selection means to automatically create a sound as said targets are selected by said target selection means; indicating means responsive to said target selection means for indicating when said targets are selected by said target selections; means for resetting said target selections; means for measuring elapsed time between said target selections and said target resettings; indicating means for indicating elapsed time measured by said measuring means; selection means for designating selection speeds of said target selections; means for selecting fake mode of said target selections in which true target selection is preceded by fake target selections for improving the judgment and coordination abilities of the player; means for communication between said electronic device and said targets whereby said targets can be placed at different distances and

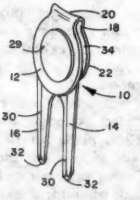


heights from the player, wherein means for supporting said target means and controlling means for generating reset signal is a rod with its top being connected to said target means and its bottom being hinged to said base means and positioned right on top of said means for generating reset signal whereby when said rod is in straight position, said means for generating reset signal is closed by the weight of said rod and when said rod is in tilted position due to the hitting of said target means by the player, said means for generating reset signal is open, thus generating a reset signal.

4,627,621
GOLF ACCESSORY

John R. Tate, 10869 Portal Dr., Los Alamitos, Calif. 90720

Filed Sep. 11, 1985, Ser. No. 774,729
Int. Cl.[4] A45F *5/00*
U.S. Cl. 273—32 B 15 Claims



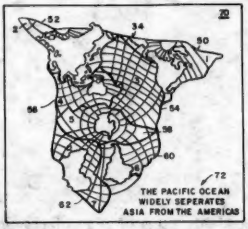
1. A combination clip and golfing accessory comprising a metal disk having a pair of thin, longitudinal legs lying in the plane of said disk and spaced from each other, a saddle curved concave upwardly and extending rearwardly from said disk opposite said legs and terminating in a spherical segment with a convex surface facing forwardly toward said disk and a concave surface facing rearwardly directly behind said disk and formed at a radius equal to the radius of a golf ball.

4,627,622

MAP PUZZLE HAVING PERIODIC TESSELATED STRUCTURE

Athelstan Spilhaus, P.O. Box 1063, Middleburg, Va. 22117

Filed Mar. 15, 1985, Ser. No. 712,364
Int. Cl.[4] A63F 9/10; G09B 29/02
U.S. Cl. 273—157 R 17 Claims



1. A map puzzle in the form of a plurality of separable interfitting pieces, the pieces obtained by:

projecting a spherical map onto a polyhedral surface having apices located adjacent preselected significant points on said spherical map, said significant points corresponding to selected locations represented on said spherical map to define planar projected figures of said spherical map on the sides of said polyhedron that enclose areas of said spherical map which are to be emphasized;

unfolding said polyhedral surface; and

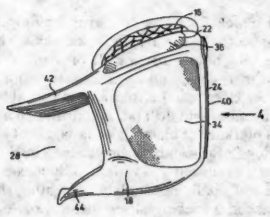
arbitrarily dividing the resultant unfolded polyhedral projection into the plurality of arbitrarily shaped interfitting pieces so that when assembled the pieces form a single tesselated representation of said spherical map.

4,627,623

HANDHELD DEVICE FOR BALL GAME

Francesco Perilli, Piazza T. Marconi 21, 64015 Nereto Teramo, Italy

Filed Sep. 4, 1985, Ser. No. 772,550
Claims priority, application Canada, Feb. 22, 1985, 474978
Int. Cl.[4] A63B 59/00, 67/00
U.S. Cl. 273—328 18 Claims



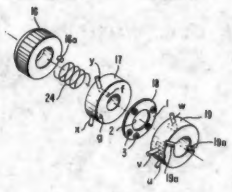
1. A game device for catching and hitting a ball comprising pocket means adapted to catch a ball, closed at one end and open at the other end, a hand enclosure, a frame extending from and connected to one side of said enclosure to which the open end of said pocket means is connected, handle means attached to and located in said hand enclosure whereby said device can be held in one hand, and wherein said hand enclosure has two or more exterior surfaces provided thereon and adapated for hitting said ball.

4,627,624

PACKING HAVING MULTIPLE SEAL PORTIONS

Seiji Usui, and Kunio Terada, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Nov. 12, 1985, Ser. No. 797,033
Claims priority, application Japan, Dec. 19, 1984, 59-193552[U]
Int. Cl.[4] F16J 15/06; F16K 11/02
U.S. Cl. 277—12 2 Claims



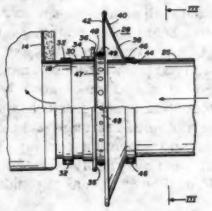
1. A packing, comprising an annular sheet formed of an elastic material, having a center axis and opposite first and second generally planar annular surfaces centered at and extending perpendicularly to said axis, and a plurality of seal portions formed integral with said sheet at circumferentially spaced apart locations about said axis, each of said seal portions extending outwardly from said first surface and having a hole therein extending parallel to said axis entirely through said sheet.

4,627,625

AIR SEAL BETWEEN RELATIVELY MOVEABLE DUCTS

Samuel C. Johnson, and James C. Elliott, both of Spartanburg, S.C., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 2, 1981, Ser. No. 250,322
Int. Cl.[4] F16J 15/08, 15/52
U.S. Cl. 277—27 4 Claims



1. A seal assembly for substantially sealed air flow communication between a first duct having a vibrational motion generally transverse to the direction of flow and a second generally stationary duct, said seal assembly comprising:

a collar member attached to and encircling said first duct adjacent the outlet thereof and providing an annular sealing surface in a plane generally perpendicular to air flow therethrough, said sealing surface having a radial dimension greater than the amplitude of vibration; and,

a diaphragm mechanism attached to and encircling the inlet to said second duct and defining a pair of annular outwardly converging side members connected at their outer periphery with one of said side members sealingly attached to said second duct and the other of said members supporting an annular sealing ring terminating in a place substantially parallel to the plane of said annular surface and extending axially into an abutting sealing engaging relationship with said annular surface, and in axial alignment therewith such that during relative vibrational movement therebetween, full annular engagement is maintained, whereby internal air pressure within said dia-

phragm mechanism provides a biasing force for maintaining said sealing engagement.

4,627,626

CHUCK FOR A HAMMER OR ROTARY IMPACT DRILL

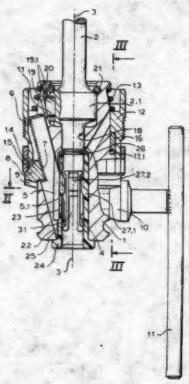
Günter H. Röhm, Heinrich-Röhm-Str. 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,596

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416964

Int. Cl.[4] B25D *17/08*

U.S. Cl. 279—1 A **16 Claims**



1. In a chuck for a drill bit having a drill bit shaft for engagement in said chuck, particularly a hammer drill chuck, comprising a chuck body connected to a drive shaft that provides hammer blows to a drill bit, a mounting opening formed in said chuck body coaxial with a chuck axis of said chuck body, said drill bit shaft being held in said mounting opening, a plurality of clamp jaws guided in said chuck body so as to be centrally advanceable to and retractable from said mounting opening, an axial passage formed in said chuck body between said drive shaft and said mounting opening, said hammer blows of said drive shaft being transmitted through said axial passage to said drill bit shaft in said mounting opening, the improvement wherein a chuck sleeve is rigidly clamped in said mounting opening and said drill bit shaft is axially slidable in said chuck sleeve.

4,627,627

PERCUSSION OR IMPACT DRILL CHUCK

Günter H. Röhm, Heinrich-Röhm-Str. 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,583

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1984, 3422195

Int. Cl.[4] B23B *31/04*; B25D *17/08*

U.S. Cl. 279—19.3 **14 Claims**

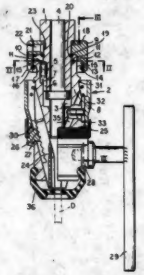
11. An impact drill chuck adapted to be secured on a drill spindle through which an impact rod is displaceable, said chuck comprising:

a chuck body;

means for keying said chuck body on said spindle for limited axial displacement relative to said spindle and rotation jointly therewith;

a ring axially fixed on said spindle, said ring having a first annular surface axially juxtaposed with a second annular surface formed on said body;

a formation projecting axially on one of said surfaces and dimensioned to brace against the other of said surfaces to preclude axial displacement of said body on said spindle; and



a recess formed in the other of said surfaces dimensioned to receive said formation to permit axial displacement of said body on said spindle upon relative rotation of said ring and said body.

4,627,628

HAMMER DRILL CHUCK

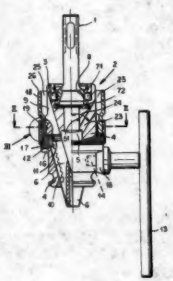
Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,888

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406668

Int. Cl.[4] B25D *17/08*

U.S. Cl. 279—20 **9 Claims**



1. In a drill chuck for a hammer drill having a rotatable chuck body connected to a drill spindle, said chuck body being formed with a tool holder for a drill bit and an open axial passage aligned therewith, said open passage being positioned so that a hammer effect can be transmitted through said open passage onto an end of said drill bit, said drill bit being engageable between a plurality of clamp jaws in said tool holder, said clamp jaws being fed through said rotatable chuck body, said clamp jaws being advanced and retracted by means of a rotatably adjustable and axially nonshiftable operating ring bearing an actuating jacket, a locking sleeve being provided on said chuck body so that it is shiftable axially between two axial positions, said locking sleeve having teeth on an end turned toward teeth on said ring, whereby said teeth mesh when said sleeve is shoved toward said ring to prevent undesired rotation during drilling, and wherein said teeth are out of engagement when said sleeve is drawn away from said ring, the improvement wherein said jacket is disposed with radial clearance from an outer surface of said chuck body so as to define a circular space between said chuck body and said jacket; said sleeve is engageable with said ring in said circular space and said jacket snugly overlaps said sleeve axially; and a plurality of cleaning

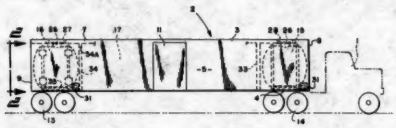
passages are provided in said chuck body, each of said cleaning passages opening at one end onto an outer circumferential surface of said chuck body and at an opposite end into said tool holder, said passages being positioned to be cleared by said sleeve, mouths of said cleaning passages at said opposite ends being positioned adjacent said axial passage in said tool holder, said cleaning passages diverging toward a spindle side of said chuck body at an acute angle to a chuck axis.

4,627,629

TRUCK TRAILER ADAPTED TO CARRY FLUID AND DRY FREIGHT AND METHOD FOR LOADING THE SAME

Hugh O'Neill, Chagrin Falls, Ohio, assignor to Transport Investment Corp., Cleveland, Ohio

Filed Jul. 3, 1984, Ser. No. 627,350
Int. Cl.[4] B60P *3/22*
U.S. Cl. 280—5 D **4 Claims**



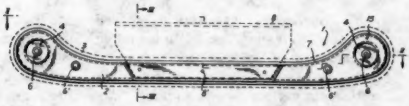
1. A truck trailer adapted to carry dry and fluid freight comprising an elongated hollow trailer body having front and rear ends, a rear running gear movably supporting the trailer body adjacent the rear end of said trailer body, a first fluid carrying tank contained in said trailer body generally adjacent the front end of said trailer body, a second fluid carrying tank normally contained in said trailer body adjacent the rear end thereof and generally above said rear running gear, and a dry freight section between said first and second fluid carrying tanks, means releasably to secure said second fluid carrying tank to said trailer, an access means in said trailer body to permit said second fluid carrying tank to be removed from and inserted into said trailer body, said access means consisting essentially of an opening in the rear end of the trailer dimensioned to allow movement of the second fluid carrying tank therethrough, said second fluid carrying tank being adapted to be selectively removed from said trailer body through said access means to permit dry freight to be loaded through said access means into the dry freight section of said trailer body before reinserting the second fluid carrying tank, means selectively to fill and empty the first and second fluid carrying tanks, a rear bulkhead across said trailer body immediately in front of said second fluid carrying tank, said rear bulkhead having access doors therein selectively to permit dry freight to be passed through said rear bulkhead.

4,627,630

CHAIN LINK RUNNER ASSEMBLY

Hans-Georg Hütter, Beckgasse 46, A 1130 Vienna, Austria

Filed Sep. 26, 1984, Ser. No. 654,777
Claims priority, application European Pat. Off., Sep. 27, 1983, 83890170.0
Int. Cl.[4] B62D *57/00*
U.S. Cl. 280—28.5 **11 Claims**



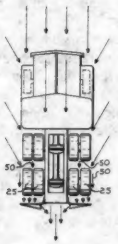
1. A chain link runner assembly comprised by:
a frame provided by opposed frame members of mirror image configuration arranged in juxtaposition and joined to each other at least at their peripheral edges, said frame members in combination defining a rigid and hollow support member of substantially closed box cross-section;
a continuous peripheral flange on each of said frame members, said respective flanges, in transverse cross-section defining opposed channel members for the reception, support and retention of retaining members of links of a chain link belts, and defining spaced guide surfaces for engagement with guide members of said belt;
said chain link belt including a plurality of link sections each hinged to an adjacent link section at its respective ends;
anti-friction members interposed between each said link section and an outwardly presented peripheral surface of said flanges;
guide members fast with each said link member and extending between said spaced guide surfaces; and
a retaining member fixed within apertures in said guide members and extending transversely of said flanges and laterally beyond said guide surfaces.

4,627,631

SPRAY-SUPPRESSING MUD FLAP ASSEMBLY

Robert C. Sherman, Clinton, Conn., assignor to Carl J. Messina, Clinton, Conn.

Filed Jun. 1, 1984, Ser. No. 616,131
Int. Cl.[4] B62D *25/16*
U.S. Cl. 280—154.5 R **22 Claims**



1. A spray-suppressing mud flap for mounting to the farme rail of truck vehicle, comprising:
a sheet element having opposed forward and rearward surfaces and being adapted for mounting aft of the vehicle tires of a truck so that said forward surface faces forwardly toward the vehicle tires,
said sheet element having upper and lower portions and opposed inboard and outboard sides,
said upper portion of said sheet element having an upper planar mounting portion and a flared portion,
said flared portion extending downwardly and inwardly so as to open downwardly, inwardly and rearwardly to form an air guiding surface in said forward surface of said sheet element to direct air downwardly and inboard of the truck,
said lower portion of said sheet element being substantially rearwardly of said upper planar mounting portion and extending substantially vertically from said flared portion for dispersal of spray downwardly, rearwardly and inwardly when mounted to a truck,
first blade means for stopping water and spray from passing upwardly over the top of said sheet element, said first blade means extending across said planar upper portion between said inboard and outboard sides and protruding forwardly from said forward surface of said sheet element, and
second blade means for stopping water and spray from passing outwardly from said outboard side of said sheet member, said second blade means extending along said

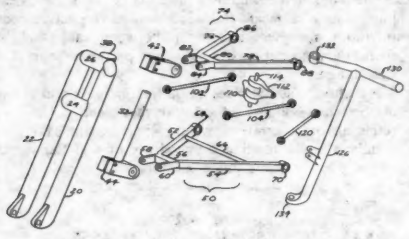
outboard side of said sheet element and protruding forwardly from said forward surface of said sheet element.

4,627,632

CYCLE SUSPENSION SYSTEM

Ollie H. McKagen, Rte. 3, Box 264, Blacksburg, Va. 24060

Filed Jul. 29, 1985, Ser. No. 760,179
Int. Cl.[4] B62K *11/12*
U.S. Cl. 280—276 **7 Claims**



1. A suspension system for the front wheel of a motorcycle having a frame assembly for supporting the suspension system, said system comprising:

a pair of upright bars, said bars having upper and lower ends and adapted to rotatably mount a wheel between their lower ends,

brace means attached to said bars adjacent the upper ends thereof to hold the bars in spaced and parallel position,

a parallelogram mechanism affixed to the cycle frame and to the pair of upright bars to control up and down movement and to allow rotary movement of said pair of bars,

a pair of semi-handlebars movably mounted on the cycle frame,

linkage means operatively connecting each semi-handlebar to the bar pair, both linkages pivoting about a common pivot pin whereby the pair of bars may be rotated by movement of either semi-handlebar independent of the other semi-handlebar,

wherein the vertical axis of the pivot pin which is the common pivot point for both handlebar linkages is parallel to the axis of rotation of the pair of bars taken in the medial longitudinal plane of the cycle, and

wherein each handlebar linkage comprises an arm connected to one of the handlebars, an intermediate link pivotally carried on the common pivot pin and operatively associated with the arm from the handlebar and a steering link connecting said intermediate link to the pair of bars.

4,627,633

TRAILER HITCH UNCOUPLE DETECTING AND SIGNALING APPARATUS

Roland P. Gehman, Stevens, and Raymond G. Martin, East Earl, both of Pa., assignors to MGS, Inc., Denver, Pa.

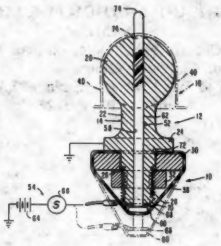
Filed Mar. 17, 1986, Ser. No. 840,304
Int. Cl.[4] B60D *1/12*
U.S. Cl. 280—432 **17 Claims**

1. A hitch uncouple detecting and signaling apparatus for use with a ball member of a trailer hitch, comprising:

(a) a plunger rod reciprocally mountable through said ball member and being longer than the height of said ball member such that one or the other opposite ends of said rod will extend beyond one or the other opposite ends of said ball member;

(b) an electrical circuit adapted for connection to a source of electrical power and including operator signaling means and a pair of contacts, one contact being carried by one end of said rod and the other contact being defined on one end of said ball member; and

(c) flexble means interconnectible to said rod and said ball member so as to bias said rod to an extended position wherein its other end extends beyond the other end of said ball member and said one contact on its one end is disposed in electrical engagement with said other contact on said one end of said ball member causing activation of said signaling means, said flexible means being yieldable so as to permit movement of said rod toward and retention thereof at a retracted position upon engagement and movement of its other end due to seating of a trailer hitch socket member on said other end of said ball member, said



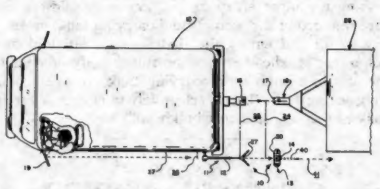
movement of said rod causing displacement and electrical disengagement of said one contact from said other contact and deactivation of said signaling means, whereby said signaling means is activated whenever the trailer hitch socket member is uncoupled from said ball member sufficiently to allow movement of said rod to its extended position, whereas said signaling means is deactivated whenever said socket member is coupled to said ball member sufficiently to retain said rod away from its extended position.

4,627,634

SIDE VISION AID FOR TRAILER HITCHING

Gary W. Coleman, Coleman Mobile Home Park, 8615 So. Highway 89, No. 16, Willard, Utah 84340

Filed Sep. 3, 1985, Ser. No. 772,042
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 280—477 **14 Claims**



13. A vehicle positioning aid for joining the hitch coupling of a towing vehicle to a mating hitch coupling of a trailer, the positioning aid comprising:

a vehicle-attachable sighting assembly including a base member with an elongate slot therethrough, a pair of suction cups each mounted upon one of a pair of externally threaded elongate stems disposed through the slot, each stem carrying a pair of internally threaded nuts, one on each side of the base member; and a sighting rod of at least two slideably adjustable telescopic portions, a connector joining one end of said sighting rod to one end of said base member angularly thereto, said connector being adjustably pivotal about an axis generally parallel to the base member; and

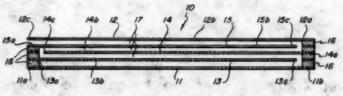
a trailer target assembly having a target rod, a base, and

means securing said rod to said base, said base being adapted to support the assembly upon the ground with the rod vertically upstanding therefrom, and means for its removable attachment to the trailer hitch coupling with the target rod vertically upstanding directly thereabove.

4,627,635

VIBRATION DAMPING UNITS AND VIBRATION DAMPED PRODUCTS

Michael T. Kozda, 15 Murray Ave., Port Washington, N.Y. 11050

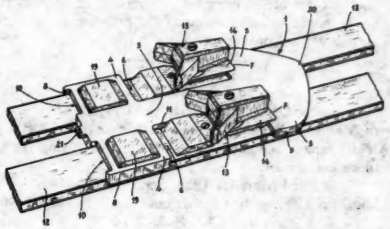
Continuation-in-part of Ser. No. 534,065, Sep. 20, 1983, abandoned. This application Jun. 11, 1984, Ser. No. 619,132
Int. Cl.[4] A63C *5/06*
U.S. Cl. 280—602 34 Claims

1. A discrete flexible vibration damping unit to co-extend with a vibratile product for sensing and damping vibrations of said product, said unit including; a framework comprising laminar group and framework portion means and said means including, a laminar group of flexible strip members of said framework having opposed side faces directly confronting one another interiorly of said group, with there being a flexible first strip member in said group, and all other of said flexible strip members in said group, including a flexible strip member next to said first strip member, being longitudinally movably free-ended and connected in said framework with said flexible first strip member in said group, and said laminar group and framework portion means having portions of said framework interconnected in said framework through said flexible first strip member in said group and said framework portions to be secured to said vibratile product with said unit co-extending with said product side facially of said framework toward said product, for said flexible strip members in said group to be flexed from side to side and longitudinally relatively move with reference to one another having said all other of said flexible strip members in said group remain connected with said flexible first strip member and longitudinally movably free-ended, when said group is flexed between said framework portions; and a tacky visco-elastic substance longitudinally reaching between said opposed side faces of all of said flexible strip members in said group about as far as said opposed side faces of one and next of said flexible strip members in said group longitudinally co-extend directly opposing one another, and said tacky visco-elastic substance directly visco-elastically interengaging said opposed side faces with one another in said group, for said unit to have said flexible strip members in said group flex from side to side and be retarded in said relative longitudinal movements thereof by said tacky visco-elastic substance when said flexible unit is on said vibratile product co-extending with said product side facially of said framework toward said product while having said framework portions secured to said product and said unit is responding to vibrations of said product by flexing between said framework portions, with said all other of said flexible strip members in said group remaining connected with said flexible first strip member in said group and longitudinally movably free-ended.

4,627,636

MONOSKI CONVERTER

Fernand Payraud, "Le Clos Baron" Domancy, 74700 Sallanches, France

Filed Apr. 10, 1985, Ser. No. 721,598
Claims priority, application France, Apr. 10, 1984, 84 05861
Int. Cl.[4] A63C *11/00*
U.S. Cl. 280—607 13 Claims



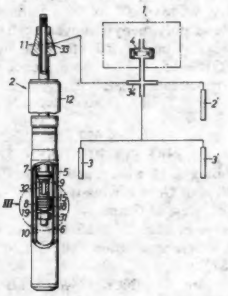
1. In combination with
a pair of skis each having an upper surface provided with a toe clamp and a heel clamp and respective ski boots securable by the clamps to the upper surfaces of the skis, a monoski converter having a rigid longitudinal stem having a front end and a rear end, the latter being integrally formed with respective rigid transversely projecting rear tabs, the tabs and stem forming a pair of like parallel seats that extend longitudinally and that are dimensioned to fit over the respective skis with the rear tabs on the respective upper surfaces between the respective toe and heel clamps, the ski boots being fitted to the clamps of the respective skis over the respective rear tabs with same pressed tightly directly by the boots against the upper surfaces of the respective skis, whereby the two skis are locked together against substantial movement relative to the boots into a monoski.

4,627,637

DAMPING FORCE-VARIABLE DAMPER DEVICE FOR VEHICLES PROVIDED WITH POWER STEERING DEVICE

Yoshihiko Toshimitsu, Asaka; Toshihiko Aoyama, Tsurugashima, and Takashi Ishida, Kawaguchi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1985, Ser. No. 714,426
Claims priority, application Japan, Mar. 29, 1984, 59-61873
Int. Cl.[4] F16F *9/46*
U.S. Cl. 280—714 3 Claims



1. In a vehicle including: a power steering device having an oil container whose pressure increases to a high level as a

steering angle becomes large; and a damper device consisting of a cylinder filled therein with a working oil and a piston fitted slidably in said cylinder to divide an interior of the cylinder into an upper oil chamber and a lower oil chamber, said damper device being adapted to damp relative movements of a chassis and a wheel support member,

a damping force-variable damper device wherein a variable throttle mechanism is interposed between said upper and lower oil chambers, said variable throttle mechanism being operable to increase a degree of restriction thereof in response to an increase of the pressure in said oil container of said power steering device.

4,627,638

SHOCK ABSORBING MATERIAL

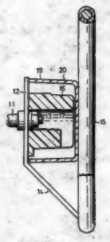
Akira Mabuchi; Sadao Uchida, and Masanao Ishikake, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Mar. 15, 1985, Ser. No. 712,254

Claims priority, application Japan, Mar. 15, 1984, 59-50632

Int. Cl.[4] B62D *1/16*

U.S. Cl. 280—779 **2 Claims**



1. A pad for an automobile steering assembly provided with a shock absorbing body composed of:

(a) a core portion having a density of 0.02 to 0.1 g/cm^3, said core portion being formed of an isocyanurate ring-containing foam, said isocyanurate ring-containing foam being a product obtained by reacting a polyhydroxy compound having a hydroxyl value of 200 to 700, triethanolamine and a polymethylene polyphenyl isocyanate having a mean functional group number of 2.3 to 3.5 in an equivalent value of NCO/OH=2.5 to 5 in the presence of a foaming agent and a trimerization catalyst, and

(b) a skin layer integrally formed on said core portion by foaming, said skin layer having a higher density than that of said core portion which is 0.1 to 1.0 g/cm^3 and being formed of an isocyanurate ring-containing foam, said isocyanurate ring-containing foam being a product obtained by reacting a polyhydroxy compound having a hydroxyl value of 200 to 700, triethanolamine and a polymethylene polyphenyl isocyanate having a mean functional group number of 2.3 to 3.5 in an equivalent value of NCO/OH=2.5 to 5 in the presence of a foaming agent and a trimerization catalyst.

4,627,639

SAFETY BELT SYSTEM

Gerhard Sedlmayr, Hamburg, and Herbert Just, Honstorf, both of Fed. Rep. of Germany, assignors to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,639

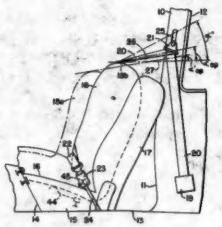
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407377

Int. Cl.[4] B60R *22/48;* **A62B** *22/20*

U.S. Cl. 280—808 **20 Claims**

1. A safety belt system, especially for motor vehicles, which includes a three-point safety belt, a self-locking belt reel-in mechanism mounted on a structural part of said vehicle, and a clamping mechanism for the belt strap of said safety belt; said clamping mechanism having at least one movable clamping jaw, and being movably disposed and guided on said structural part, with a drive mechanism being provided for effecting movement of said at least one clamping jaw of said clamping mechanism;

the improvement therewith wherein said clamping mechanism, adjustable to change adaptive positioning of said safety belt for strapping-in of a person; and wherein, for automatic vertical adjustment of said clamping mechanism, a value-determining and computing unit is provided which senses the position of said belt strap relative to at



least one parameter of its functional connection with a strapped-in person, and which undertakes a comparison, with reference to a fixed desired value and the actual value of said belt strap position as determined relative to said at least one parameter to ascertain whether a deviation exists between said two values; said value-determining and computing unit, via an adjusting mechanism, accordingly having an operative relationship that initiates a vertical adjustment of said clamping mechanism when said ascertained deviation continuously exceeds a designated deviation between said desired value and said actual value.

4,627,640

ALBUM WITH FOLDABLE SHEETS

Margaret Markovics, Upper St. Clair, Pa., assignor to ACT Laboratories, McMurray, Pa.

Filed Sep. 27, 1985, Ser. No. 780,896

Int. Cl.[4] B42D *19/00, 3/18;* **G09B** *29/04;* **G09F** *1/00*

U.S. Cl. 281—5 **12 Claims**

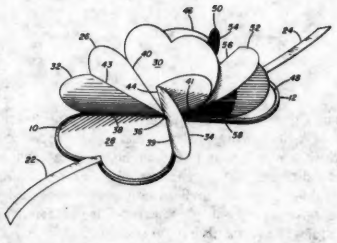
1. An automatically foldable and unfoldable album assembly comprising a front cover and a rear cover hingedly joined together and with a plurality of foldable sheets joined together in strip fashion,

each of said foldable sheets formed from a first outer panel, a second outer panel, a first inner panel and a second inner panel, with said first inner panel disposed between said outer panels and joined thereto along diagonal fold lines, with said second inner panel disposed opposite said first inner panel and between said outer panels and joined thereto along diagonal fold lines,

said panels each being confined within the diagonal quadrants of a square, each of said outer panels having the same configuration, each of said inner panels having a central vertical fold extending therethrough, said inner panels being complementary with said outer panels whereby when said sheet is moved to a folded configuration, said inner panels fold inwardly toward each other and are completely enclosed by said outer panels,

with a rear surface of the first outer panel of a first of said sheets joined to said front cover, with a rear surface of the second outer panel of the last of said sheets joined to said rear cover, and with a rear surface of the second outer panel of each of the sheets, except for the last sheet, joined to a rear surface of the first outer panel of the sheet imme-

diately adjacent thereto, whereby when one sheet is moved to a closed configuration the sheet immediately



adjacent thereto will automatically be moved to an open configuration.

4,627,641

TWO-COLOR THERMOSENSITIVE LABEL

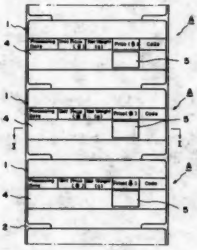
Hatsuo Kawaguchi, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Aug. 12, 1983, Ser. No. 522,568

Claims priority, application Japan, Aug. 12, 1982, 57-123128[U]

Int. Cl.⁴ G09F *3/00, 3/10*

U.S. Cl. 283—81 **3 Claims**



1. A thermosensitive label, comprising:

a label substrate; and

first and second color developing materials, said first color developing material being applied over the entire label substrate, said second color developing material being applied over said label substrate at a predetermined location, and said first and second color developing materials being selectively developable to provide respective colors by application of approximately the same temperatures to respective portions of said locations where the respective colors are desired.

4,627,642

METHOD OF MARKING FOR DETERRING FRAUD WITH VALUABLE DOCUMENTS

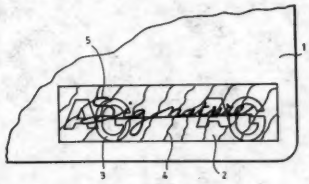
Georges Peronneau, La Celle St Cloud, and Bernard Chalus, Ollainville, both of France, assignors to Sotimag (SARL), Massy, France

Filed Sep. 5, 1985, Ser. No. 772,764

Claims priority, application France, Sep. 7, 1984, 84 13760

Int. Cl.⁴ B42D *15/00*

U.S. Cl. 283—92 **19 Claims**



1. A method for deterring fraud with documents having monetary value comprising a substrate (1) including a predetermined signature location, including the steps of:

depositing on the signature location a first supporting layer of ink (2) including a pigment having a predetermined porosity with respect to the substrate;

depositing on selected zones of the first supporting layer (2) a porous varnish layer (3), including in solution a powder enabling a fluorescence of a desired color to be obtained under ultraviolet light;

printing a filigree pattern on selected zones of the first supporting ink layer (2) and on the varnish layer (3) by silk-screening, using a second pigmented vinyl ink (4); and

applying an identifying signature (5) to the card using a felt-tip pen having an indelible ink wherein the porosities of the first ink layer (2) and of the layer (3) are different, and the penetration of the vinyl ink is better on the first ink layer (2) than on the varnish layer (3); and

the adherence of the indelible ink on the first ink layer (2) is better than the adherence of the varnish layer (3) on the first ink layer (2).

4,627,643

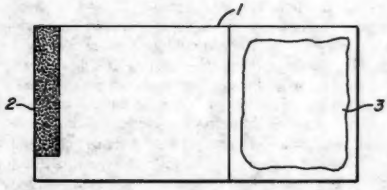
CONTEST CARD HAVING ELASTOMERIC COATING REMOVAL MEANS

Fred L. Leonetti, and Richard L. Leonetti, both of P.O. Box 6622, Concord, Calif. 94519

Continuation-in-part of Ser. No. 803,002, Nov. 29, 1985, abandoned. This application Mar. 25, 1986, Ser. No. 843,870

Int. Cl.⁴ B42D *15/00*

U.S. Cl. 283—102 **4 Claims**



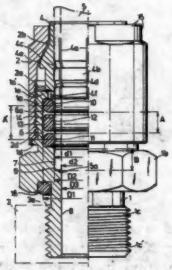
1. In a flexible card whose surface contains printed information concealed by an opaque coating, the improvement comprising a layer of abrasive material on said card for abrading said opaque coating to expose said printed information when said card is folded, bringing said layer of abrasive material into contact with said removable opaque coating.

4,627,644

ARRANGEMENT FOR A PUSH-IN COUPLING

Kjell R. Ekman, Aberenrain 43, CH-6340 Baar, Switzerland

Filed Aug. 9, 1983, Ser. No. 521,766
Claims priority, application Sweden, Aug. 27, 1982, 8204910
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—3 15 Claims



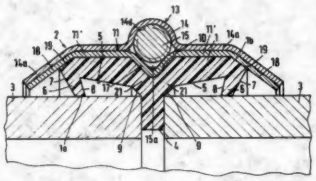
1. A coupling device for the rapid and simple push-in connection of one end of a first element to a second element through which fluid, and/or pressure exerted by fluid, is conducted utilizing a retaining arrangement where at least the external surface near said end of said first element is made of a soft material into which at least one retaining means of said arrangement can be engaged after said end has been pushed in to retain said end, said arrangement comprising: an outer part having a first outer part element and a second outer part element, said second outer part element having a tapered inner wall and said second outer part element being interconnected onto said first outer part element; an insertion part confined between said tapered inner wall surface of said second outer part element and an end surface of said first outer part element, said insertion part further bearing said retaining means; a cavity formed along the inner wall in said first outer part element and a seal arrangement disposed in said cavity for coacting with the external surface of said end of said first element to seal the inside of the outer part and the fluid and/or pressure exerted by the fluid from the exterior of the outer part, said seal arrangement comprising two sealing devices and a guiding device, said sealing devices disposed one on each side of said guiding device, said guiding device effecting the guiding of said end while it is being pushed in and also continuing to center the end in the cavity after the push-in connection has been completed, wherein said guiding and sealing devices are adapted to provide a vibration-damping double seal with the sealing devices spaced apart from each other as viewed in the longitudinal direction of the end, wherein the insertion part due to its resilient qualities has an inherent retaining effect on said end, wherein said insertion part is longitudinally movable inside the outer part relative to the outer part, between said tapered wall of said second outer part element and said end surface of said first outer part element and in front of the seals, viewed from the insertion direction of said end, wherein said insertion part has a reduced end portion extending into said second element toward said sealing means, and wherein an L-shaped radial gap is formed between said end of said insertion part and said end surface of said first outer part element for preventing removal of said sealing means from the sealing position.

4,627,645

FLEXIBLE PIPE COUPLING

Heinz Sauer, Ronneburg, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Feb. 5, 1985, Ser. No. 699,320
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404739
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—39 14 Claims



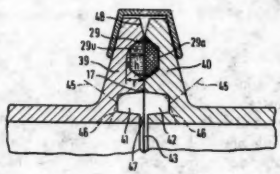
1. A coupling for the establishment of a fluidtight connection between the neighboring end portions of two pipes, comprising an elastic sleeve having two open ends, an external surface, an internal surface, and an annular partition extending from said internal surface intermediate said open ends and between those end portions of the pipes which are inserted into the sleeve through the respective open ends; and a clamp including a split ring surrounding said external surface and having first and second end portions, and female tightening means comprising first and second substantially strip-shaped components externally bonded to the respective end portions of said split ring and each extending transversely of the split ring, each of said components having a tunnel-like median section with a circumferential extent greater than the strip thickness spaced apart from and defining a passage with the respective end portion of said split ring, and said clamp further including male tightening means comprising a shank extending through said passages and two retaining elements extending from said shank and flanking the median sections of said components, said split ring including a band having two marginal portions overlying the open ends of said sleeve, and each of said marginal portions sloping inwardly as considered in a direction away from said partition and defining an acute angle with the longitudinal axis of said sleeve, said components being bonded to said band at said marginal portions.

4,627,646

PIPE FITTING

Bernhard Kessel, Bahnhofstr. 31, 8071 Lenting, Fed. Rep. of Germany

Filed May 13, 1983, Ser. No. 494,220
Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3218061; Nov. 3, 1982, 3240582
Int. Cl.[4] F16L *13/04*
U.S. Cl. 285—114 9 Claims



1. A pipe fitting assembly comprising:
a first pipe fitting having a body formed with a flow cross section between two openings formed in said body so that a flow path between said openings forms an arcuate bend

extending over an arc length at least 45°, said openings being bounded by radially outwardly extending peripheral flanges lying in respective planes and formed unitarily on said body with respective axially outwardly facing grooves, said flanges being inclined with respect to one another at at least 45° and having a thickness at an outermost region of each flange only slightly exceeding the wall thickness of said body;

a second fitting having a flange extending peripherally around an opening thereof; and

a clamping collar forming a channel engaging around one of said flanges of said first fitting and said flange of said second fitting which is positioned to abut said one of said flanges of said first fitting to bear upon respective flanks of the flanges around which said collar engages, said flanks tapering outwardly away from interiors of said fitting toward one another and said channel having sides engaging said flanks which converge outwardly, said flanges of said first fitting being spaced apart sufficiently to accommodate said collar between them, all of said flanges and openings having the same diameters, respectively, said abutting flanges being relatively rotatable through 360° prior to tightening of said collar, each of said flanges interconnected by said collar being formed with a circular groove opening toward the groove in the other flange and registering therewith whereby said grooves receive a common sealing ring, and between said groove and the respective opening in each of the flanges connected by said collar, a respective annular recess is provided opening at a surface of the flange and serving to define a bending zone of reduced thickness between the outer portion of the respective flange and said body.

4,627,647

WALL FEEDTHROUGH FITTING

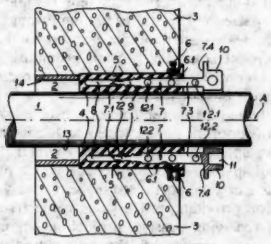
Werner Hauff, Herlbühlsstr. 19, 7925 Dischingen-Ballmertshofen, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,877

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1984, 3408122; Aug. 30, 1984, 3431805

Int. Cl.⁴ F16L *5/00*

U.S. Cl. 285—189 **7 Claims**



1. A feedthrough fitting for a conduit, the fitting comprising:

a wall formed with a throughgoing passage extending along an axis and having a radially inwardly directed wall surface, whereby a conduit passes axially through the passage;

an elastomeric adapter sleeve having

an outer surface complementarily radially outwardly engaging the wall surface,

an inner surface snugly surrounding and engaging the conduit, and

an axially backwardly open and annular groove between the inner and outer sleeve surfaces, having generally cylindrical and confronting inner and outer groove surfaces, and being between the inner and outer groove surfaces of a predetermined radial width in a relaxed condition of the sleeve; and

a tightening ring having an axially forwardly tapered portion and a generally cylindrical portion extending axially backward therefrom and of a radial dimension greater than the width of the groove between the groove surfaces and fitting so tightly in the groove as to press the sleeve radially outward against the surface of the passage and inward against the conduit along the full length of the cylindrical portion, the ring being formed of at least two similar sector-shaped ring parts having the same radius of curvature as the groove and having ends provided with angularly interfitting formations.

4,627,648

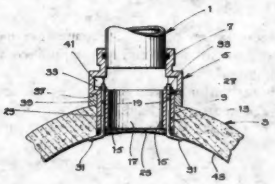
PIPE SADDLE JOINT AND ASSEMBLY

Jean Montpetit, Boucherville, Canada, assignor to Uroplast Inc., Longueuil, Canada

Filed Dec. 9, 1985, Ser. No. 806,514

Int. Cl.⁴ F16L *41/08*

U.S. Cl. 285—197 **16 Claims**



1. A pipe saddle joint comprising:

an essentially tubular body having a longitudinal axis and including a branch pipe insertion part and a main pipe connecting part coaxial with said insertion part; said parts defining radial shoulder means therebetween, inwardly of said body, and said connecting part having an outer end located away from said inward shoulder means;

said connecting part being formed with at least two bolt passages extending between said shoulder means and said outer end;

two L-shaped anchor bolts, each having a stem portion threaded at one end and a bent portion at the other end; each of said stem portions extending through one of said passages with the threaded end thereof projecting above said inward shoulder means, said bent ends facing said outer end, and

a pair of bolt nuts, each screwed over one of said threaded ends.

4,627,649

REMOTE CONTROL LOCKING AND UNLOCKING DEVICE, ESPECIALLY FOR AN ANTI-PANIC BAR

Robert Leplat, La Garenne Colombes, France, assignor to Brunam Controle Sarl, Suresnes, France

Filed Nov. 7, 1984, Ser. No. 669,025

Claims priority, application France, Oct. 19, 1984, 84 16104

Int. Cl.⁴ E05C *15/02*

U.S. Cl. 292—92 **9 Claims**

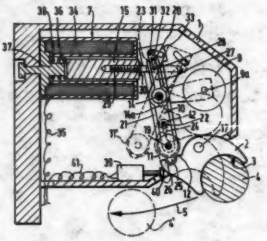
1. A remote control locking and unlocking anti-panic device comprising:

a latch rotatably oscillating within a housing and including a first cam outline and a second hollow external outline, said second hollow external outline being adapted to conform with at least one part of a peripheral section of an anti-panic bar and adapted to mesh with said section in order to assume a position which blocks displacement of the anti-panic bar; and

a lever arm having first and second ends articulated on a pivoting axle;

an electromagnet means having a core connected to said second end of said lever arm for selectively maintaining said lever arm in a first position which prevents rotation of said latch; and

supplementary locking means formed in said lever arm for locking rotation of said latch with respect to said lever arm when said lever arm assumes said first position;



whereby energization of said electromagnet means causes said lever arm to pivot and be maintained in said first position; and

whereby de-activation of said electromagnet means releases said lever arm from said first position, thereby enabling rotation of said latch and displacement of said anti-panic bar.

4,627,650

CLASP FOR CLOSABLE ARTICLES

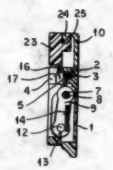
Franz Hauschulte, Menden, Fed. Rep. of Germany, assignor to Sudhaus Schloss- und Beschlagetechnik GmbH & Co., Iserlohn, Fed. Rep. of Germany

Filed Apr. 19, 1985, Ser. No. 725,325

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 8412303[U]

Int. Cl.⁴ E05C *5/02*

U.S. Cl. 292—113 **8 Claims**



1. In combination with a receptacle having an upper portion and a lower portion, a clasp comprising;

an upper part affixed to said upper portion and having a projection;

a base plate supporting a lower part of said clasp and fixed to said lower portion;

an actuating lever pivotally mounted on said base plate and having a pair of opposite longitudinal edges along longitudinal edges of said base plate;

a U-shaped tension member having legs straddling said lever and providing respective longitudinal edges respectively juxtaposed with the longitudinal edges of said lever, said tension member being engageable with said projection to draw said parts together, the juxtaposed longitudinal edges of said lever and said member being provided at opposite ends with respective pins each extending toward the other longitudinal edge; and

a pair of links each received between two of said juxtaposed edges and traversed by the said pins thereof for coupling said lever to said tension member, said base plate being formed along its longitudinal edges at an upper side thereof with a pair of cams engageable with cams formed on said legs for biasing said tension member outwardly upon swinging movement of said lever into an open position said base plate being formed with respective flanks along its longitudinal edges at a lower side of said plate engageable with said tension member for biasing an upper portion of said tension member inwardly against said upper part upon swinging movement of said lever in an opposite sense into a closed position of said lever.

4,627,651

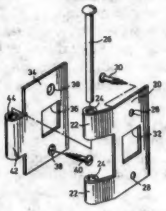
SAFETY LOCKING DEVICE FOR DOORS

Robert H. Grimbly, 337 Upper Ottawa Street, Hamilton, Ontario, Canada (L&T 3S5)

Continuation of Ser. No. 654,714, Sep. 27, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 844,247

Int. Cl.⁴ E05C *19/18*

U.S. Cl. 292—288 **2 Claims**



1. The combination of a safety device with a door and its surrounding door frame and with a door lock or passage set mounted on the door and the frame and having a door frame edge strike plate, a door face plate and a lock bolt for holding the door closed in the frame, the safety device being fastened to the vertical opening edge of the door and the adjacent vertical edge of the frame, the safety device comprising:

a thin strike plate portion replacing or installed over the strike plate of the door lock or passage set, the strike plate portion having an aperture therein through which the lock bolt passes and apertures therein through which pass fastening means fastening the portion to the said door frame vertical edge, the portion providing at least one respective connecting lock pin receiving passage projecting beyond the door frame outer face;

a thin face plate portion replacing or installed over the face plate of the door lock or passage set, the face plate portion having an aperture therein through which the lock bolt passes and apertures therein through which pass fastening means fastening the portion to the said door vertical edge, the portion providing at least one respective connecting lock pin receiving passage projecting beyond the door outer face registering with the door closed with the said pin receiving passage of the strike plate portion; and

a connecting lock pin inserted in the registered pin receiving passages of the said two portions connecting them together and thereby holding the door closed.

4,627,652

LOCK FOR SLIDING DOORS AND WINDOWS

Thomas Sakkas, and Athanasios Sakkas, both of 10th Kilom. National Road, Athens-Lamia, Chamomylon-Acharnes, Greece

Filed Aug. 12, 1985, Ser. No. 764,578

Claims priority, application Greece, Oct. 24, 1984, 80579

Int. Cl.⁴ E05C *3/26*

U.S. Cl. 292—229 **5 Claims**

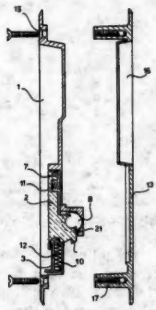
1. A lock for sliding doors and windows, comprising:

an inside plate for mounting on the inside of a door frame, said plate having a cylindrical opening formed therein,

a latch lever pivotally attached to said plate, said latch lever having a pair of detents thereon, said detents being located so as to define first and second locking positions,

a headed member extending from said jamb plate toward said opening,

means on said lever for engaging said headed member when said member lies within said cylindrical opening,



spring means biasing said lever toward a first position out of engagement with said member, and

catch means, adapted to engage either of said detents, for holding said lever in a second position in engagement with said member whereby said door or window may be secured.

4,627,653

CARPET STRETCHER

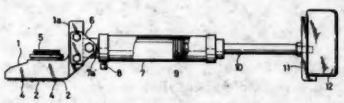
Arata Koroyasu, Tatsuno, Japan, assignor to Kyokuto Sanki Kabushiki Kaisha, Tatsuno, Japan

Filed Aug. 27, 1985, Ser. No. 769,830

Claims priority, application Japan, Aug. 27, 1984, 59-129641[U]

Int. Cl.[4] A47G *27/04;* B26F *1/32;* F04F *21/20*

U.S. Cl. 294—8.6 **2 Claims**



1. A carpet stretcher for stretching a fabric carpet, the carpet stretcher comprising:

an engaging head having an array of prongs thereon extending downwardly therefrom and at an oblique angle thereto to slant in a first direction for engaging the fabric of the carpet to push the carpet in the first direction;

an unvented fluid cylinder having first and second ends, wherein the first end of the cylinder is connected to the engaging head;

an inlet port adjacent to the first end of the cylinder for applying pressurized gas to the cylinder, the port including means for sealing the port to retain the gas in the cylinder;

a piston rod assembly having a piston disposed in the cylinder between the first and second ends wherein the first end is projected beyond the second end of the fluid cylinder, and

a knee pad connected to the second end of the piston for abuttment with an operator's knee wherein the distance between the engaging head and knee pad is readily adjustable to suit operators of various sizes; wherein the gas within the cylinder is compressed upon impulsing the knee pad with one's knee while holding the cylinder in one's hand to absorb the shock of the impulse, and wherein expansion of the compressed gas after the impulse contributes to stretching the carpet.

4,627,654

ARTICULATED PARALLELOGRAM GRIPPER

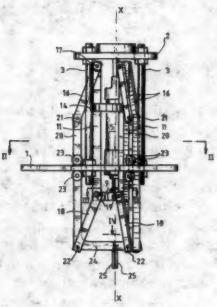
Michel D. Van Oost, Marcoussis, France, assignor to Automobiles Citroen, Neuilly sur Seine and Automobiles Peugeot, Paris, both of France

Filed Feb. 6, 1985, Ser. No. 698,768

Claims priority, application France, Feb. 7, 1984, 84 02116

Int. Cl.[4] B66C *1/00*

U.S. Cl. 294—106 **4 Claims**



1. A gripper for fitting to a robot and adapted for gripping a circular workpiece of a workpiece having a circular bore, said gripper comprising:

a support including a guide in a guide plane perpendicular to an axis and provided with a plurality of windows elongated in generally radial directions with respect to said axis and angularly spaced thereabout;

respective articulated parallelogrammatic linkages lying in respective axial planes and received in respective ones of said windows, each of said linkages including:

a first arm generally perpendicular to said guide plane and moveable substantially exclusively parallel to said guide plane,

at least one pair of rollers journalled at fixed locations on said first arm and riding on said guide,

a second arm parallel to said first arm and movable in the respective window generally perpendicular to said guide plane,

respective links coupling said arms together, and

a clamping finger on an end of said first arm and positioned to cooperate with the clamping fingers of the other parallelogrammatic linkages to grip a said workpiece; and

actuating means coupled to said second arms and connected with said support for displacing said second arms generally perpendicular to said guide place to simultaneously cause said fingers to approach and recede from one another selectively.

4,627,655

PICK-UP CAP CONSTRUCTION

John Collins, Elkhart, Ind., assignor to Leer, Incorporated, Elkhart, Ind.

Filed Jan. 21, 1983, Ser. No. 460,034

Int. Cl.[4] B60P *3/32;* B62D *27/00*

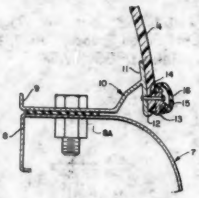
U.S. Cl. 296—167 **11 Claims**

1. Pick-up cap construction comprising:

a shell body exhibiting a top and sidewalls extending downwardly therefrom,

mounting rail means extending longitudinally along the

respective inside bottom portions of said shell body sidewalls, said mounting rail means including a horizontally extending base member part and a shell body sidewall support part formed integrally therewith, said base member part being supportingly engageable with upwardly facing pick-up truck box sidewall means when said cap construction is in an in-use position on a pick-up, and said shell body sidewall support part being engagable underneath and along the inside of a shell body sidewall,



trim holder means extending along the outside of the bottom portion of each of said shell body sidewalls, said trim holder means including an upwardly facing portion engagable under the respective sidewall and in facing relationship to said shell body sidewall support part, said trim holder means including a profile shape for interlockingly holding a decorative trim piece, and

connecting means extending through said trim holder means, sidewall, and shell body sidewall support to clampingly and fixedly hold the same together.

4,627,656

SEAT FOR AUTOMOBILE

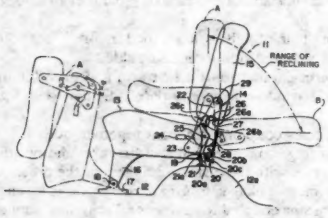
Hiroyuki Gokimoto, and Isao Kiyomitsu, both of Hiroshima, Japan, assignors to Mazda Motor Corporation and Delta Kogyo Co., Ltd., both of Japan

Continuation of Ser. No. 410,637, Aug. 23, 1982, abandoned. This application Apr. 2, 1985, Ser. No. 719,140

Claims priority, application Japan, Aug. 26, 1981, 56-133720; Sep. 4, 1981, 56-140063

Int. Cl.[4] B60N *1/02*; A47C *13/00*

U.S. Cl. 296—65 R **9 Claims**



1. An automobile seat comprising a seat bottom rotatable around a transverse axis approximately parallel to a car body floor up to a position where the rear portion of the seat bottom is free from the floor, a seat back inclinably mounted on said seat bottom, a seat bottom locking means for releasably locking the rear portion of said seat bottom to said floor so as to allow forward rotation of said seat bottom around said transverse axis when unlocked, a seat back locking means for releasably locking said seat back to said seat bottom, and an operating member, movable from a first position to a second position, connected to said seat bottom locking means and said seat back locking means by a connecting means for simultaneously releasing both said seat bottom locking means and said seat back locking means when said operating member is moved from said first position to said second position.

4,627,657

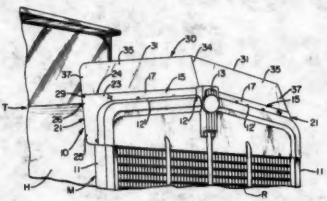
TRUCK DEFLECTOR SHIELD

John A. Daniels, Arvada, and John H. Ziegler, Longmont, both of Colo., assignors to Autotron Products, Inc., Longmont, Colo.

Filed May 17, 1984, Ser. No. 611,499

Int. Cl.[4] B60J *1/20*

U.S. Cl. 296—91 **14 Claims**



1. A shield assembly for mounting on a motor vehicle characterized by having a hood portion with a radiator grille suspended by a peripheral molding, said molding having a generally horizontal upper edge surface and opposite vertical side edge surfaces, said shield assembly comprising:

an elongated shield of transparent material having a lower edge, opposite ends of said shield being angled rearwardly with respect to the plane of said shield;

a mounting base portion comprising a pair of elongated horizontal frame members disposed in end-to-end relation traversing and conforming to the contour of said upper edge surface of said molding between said side edge surfaces, and end cap members disposed at opposite distal ends of said frame members and forming continuations thereof, said end cap members curving rearwardly and downwardly along said side edge surfaces of said molding, said frame members and said end caps each having a front wall and a rear wall defining a rearwardly inclined, upwardly opening channel therebetween, said lower edge of said shield and said opposite ends thereof inserted in said channel; and

means for connecting said base portion and said end cap members in contact with said upper edge surface and said side edge surfaces, respectively, of said radiator molding.

4,627,658

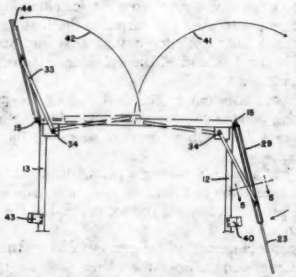
POWER-ASSISTED SEMI-TRAILER TRUCK BODY TOP COVER

Donald J. Vold, Pottsville, Pa.; Saul R. Spector, Hallandale, Fla.; Anthony J. Piller, Schuylkill Haven, Pa., and Hilda M. Vold, legal representative of said Donald J. Vold, deceased, assignors to Set Manufacturing Co., Pottsville, Pa., a part interest

Filed Feb. 29, 1984, Ser. No. 584,601

Int. Cl.[4] B60P *7/02*

U.S. Cl. 296—100 **4 Claims**



1. A power-driven hinged, sectional semi-trailer truck body roof cover in combination comprising:

an open top semi-trailer truck body having a transverse

cabside wall, a longitudinal, curbside wall, a second longitudinal roadside wall and a transverse rear wall each wall having a top and

(a) a metal tubular, roadside, longitudinal, tubular member upon which are mounted hinges for attaching the half-frame to the top of the curbside wall of the trailer body, said member's length being essentially equal to that of the top of the sidewall; said half-frame having

(1) a second tubular longitudinal member which is longer than the distance which is defined between the transverse walls such that overlapping portions are created at the ends of the second member permitting it to rest on the tops of the transverse walls when the half-frame is rotated inboard on the hinges to rest on the trailer transverse wall tops and such that the half-frame provides cover means to a half of the trailer body top over which it rests, said half-frame also having

(2) a long transverse tubular member centrally disposed across the longitudinal members of the half frame and of a length defined by the distance from the first longitudinal member to the outer edge of the side wall opposite; said half-frame also having

(3) a metal transverse, extruded member forming the cabside end of the half-frame which member has a "C" shaped cross-section which defines a semi-enclosed track with a longitudinal opening, said transverse member being mounted on the half-frame such that the opening faces cabside and is of a length defined by the distance between the first and second longitudinal members and such that

(4) inside the track is slidably and rollably fitted a disc shaped roller, rotably mounted on a pin which is slidably mounted in a bearing in a first end portion of an arm which is of rectilinear cross-section and which is mounted perpendicularly to a longitudinal axis thereof, such that the pin may slide perpendicularly to the longitudinal axis of the arm, the arm further having a second end portion which is affixed perpendicularly to a cabside directed rotatable shaft of a powered rotating means which is mounted on the cabside wall below the top thereof such that when the powered shaft is rotated in one direction the arm will rotate in the same direction and the roller will rollably slide in the track causing the half-frame to rotate in an arc about the hinges and swing up from the trailer body and outward thereof to a position which is determined by stopping the shaft rotation and which provides access to the trailer body portion under the half-frame and such that when the shaft is rotated oppositely the arm will also rotate and the roller will rollably slide in the track in the opposite direction causing the half-frame to close and such that when closed the half-frame will lie flat across a half opening of the trailer body thereby enclosing half of it, and

(b) a metal tubular, curbside, longitudinal, rectilinear, open top half-frame, covered with debris arresting means which half frame has a first longitudinal, tubular member upon which are mounted hinges for attaching the half-frame to the top of the remaining, roadside wall of the trailer body, said member's length being essentially equal that of the top of the sidewall; and half-frame having

(1) a second tubular, longitudinal member which is longer than the distance which is defined between the transverse walls such that overlapping portions are created at the ends of the second member permitting it to rest overlappingly on the first half-frame when the second half-frame is rotated on its hinges inboard of the trailer open top and such that the second half-frames provides cover means to a remaining half of the trailer body; and second half-frame also having

(2) a metal transverse, extruded member forming the cabside end and having a "C" shaped cross-section which defines a semi-enclosed track with a longitudinal opinion, said transverse member being mounted on the half-frame such that the opening faces cabside and is of a length defined by the distance between the first and second longitudinal members of the half-frame said transverse member also having a notch cut into its inboard end such that the half-frame is enabled to seat itself snugly, overlapping and longitudinally alongside the first half-frame, and

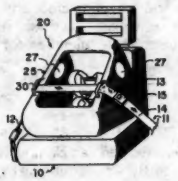
(3) inside the transverse track member is slidably and rollably fitted a disc shaped roller, rotably mounted on a pin which is slidably mounted in a bearing in a first end portion of an arm which is of rectilinear cross-section and which is mounted perpendicularly to a longitudinal axis thereof such that the pin may slide perpendicularly to the longitudinal axis of the arm, the arm further having a second end portion which is affixed perpendicularly to a cabside directed rotatable shaft of a powered rotating means which is mounted on the cabside wall below the top thereof such that when the powered shaft is rotated it will provide rotable motion to the roadside half-frame identical with that of the curbside half-frame and such that when the power means is activated by sequential switching means, each half-frame may be swung open providing access to the top of the trailer body, or closed, thereby covering the trailer body top opening and arresting debris attempting to escape therefrom.

4,627,659

INFANT'S SEAT AND RESTRAINER

Dennis E. Hall, Reseda, Calif., assignor to T. Ghiglia, Reseda, Calif.

Filed May 6, 1985, Ser. No. 731,028
Int. Cl.[4] A47C *31/00*
U.S. Cl. 297—488 **11 Claims**



1. An infant's seat, said seat being adapted to be inflated and being mountable on an automobile seat in conjunction with an existing standard seat-belt-buckle arrangement, said inflatable seat comprising in combination:

an inflatable seat portion which in its inflated condition with an upwardly directed wall is adapted to support the legs and lower torso of an infant;

an inflatable generally upright back portion unitarily joined to said seat portion and which in its inflated condition with a forwardly directed wall provides support for an infant using the seat in a sitting position;

an inflatable canopy portion unitarily joined to said seat portion to shield the head region of an infant;

upstanding side walls for limiting lateral and allowing sufficient freedom of movement of an infant using the seat; with every side wall having a height which exends between said canopy portion and said seat portion and every side wall being unitarily joined to said seat portion, said back portion, and said canopy;

said seat portion, said upright back portion, said canopy portion, and said side walls being unitarily joined to form a continuously hollow and inflatable structure of open shell configuration of a depth allowing substantially full

freedom of movement of the legs and arms of an infant using said seat;

at least one window means in each side wall for increasing the viewing range of an infant;

at least one air inflator valve for inflating and deflating said inflatable structure;

on each side wall an integrally joined ring for passing therethrough a respective seat belt whereby the infant's seat is fixed on the automobile seat in the secured condition of a respective seat belt; and

harness means secured to the forwardly directed wall of said back portion, said harness means contributing substantially to the protection of a user in said seat.

4,627,660

BUTTON FOR AN AUTOMOTIVE SEAT

Shigeki Kon, Akishima, Japan, assignor to Tachikawa Spring Co. Ltd., Tokyo, Japan

Filed Feb. 27, 1986, Ser. No. 833,603

Claims priority, application Japan, Feb. 28, 1985, 60-28333[U]

Int. Cl.[4] A47C *27/00*

U.S. Cl. 297—219 **4 Claims**

1. A button for use in an automotive seat, comprising:

a trim cover assembly comprising a lamination of a top cover member, a wadding of foam material and a wadding cover,

a button core member disposed on the side of said wadding cover of said trim cover assembly,

a reinforcing member for fixing said button core member to said trim cover assembly, and,

a recessed portion formed on the side of said top cover member of said trim cover assembly by pressing and heating said trim cover assembly and said reinforcing member around said button core member for integral welding thereof.

4,627,661

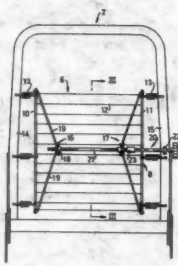
CHAIR BACK WITH ADJUSTABLE LUMBAR SUPPORT

John Rönnhult, Södertälje, and Jan Eklund, Möonsterås, both of Sweden, assignors to BE - GE Stolindustri AB, Oskarshamn, Sweden

Filed Jul. 25, 1984, Ser. No. 634,229

Int. Cl.[4] A47C *7/46*

U.S. Cl. 297—284 **6 Claims**



1. In a seat back having generally upright, spaced-apart side members, a forward face and a back face: two generally upright side elements disposed between said side members, said side elements being of stiff, resilient rod-like construction; transverse tension members connecting each rod-like side element to a respective one of said side members; elongated transverse connecting members connected between said rod-like side elements and maintained in tension by the force of said tension members on said rod-like side elements; a buckling assembly including tensioning members connected to the opposite ends of each rod-like side element for applying thereto buckling forces which cause the respective rod-like side element to arch in a direction such that the center region of the respective rod-like side element moves forward whereby said rod-like side elements and said transverse connecting members form a lumbar support assembly; an adjustable tensioning means supported by said seat back intermediate the ends of the side elements for adjusting said tensioning members in a manner to selectively increase and decrease the buckling forces applied to the opposite ends of said rod-like side elements to thereby change the amount of buckling of said rod-like side elements.

4,627,662

TILTING MECHANISM FOR A CHAIR

David E. Carter, Hemel Hempstead; Malcolm J. Bailey, Newport Pagnell, and Brian A. Willatts, Milton Keynes, all of England, assignors to Pledge Office Chairs Limited, London, England

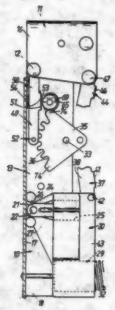
PCT No. PCT/GB84/00272, § 371 Date Apr. 3, 1985, § 102(e) Date Apr. 3, 1985, PCT Pub. No. WO85/00734, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 8, 1984, Ser. No. 719,282

Claims priority, application United Kingdom, Aug. 9, 1983, 8321400; Oct. 17, 1983, 8327750

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—313 **10 Claims**



1. A tilting mechanism for a chair comprising

(a) a seat frame member for mounting a seat portion of the chair thereon, said seat frame member defining an inverted channel including a base and parallel side flanges,

(b) a backrest frame member for mounting a backrest portion of the chair thereon, a first horizontal axis extending between said parallel side flanges, said backrest frame member being pivotally mounted on said first horizontal axis for movement towards or away from said inverted channel,

(c) a support frame member for mounting on a base part of the chair, a second horizontal axis extending between said parallel side flanges, said seat frame member being pivotally mounted on said second horizontal axis for movement about said support frame member,

(d) a first quadrant member pivotally mounted between said parallel side flanges for movement in a plane parallel to said side flanges, an upper edge of the first quadrant member, a plurality of recesses in said upper edge of the first quadrant member, a first link means pivotally connected

between said backrest frame member and said first quadrant member converting pivotal adjustment movement of the backrest frame member into pivotal movement of the first quadrant member,

(e) a second quadrant member pivotally mounted between said parallel side flanges for movement in a plane parallel to an upper edge of the second quadrant member, a plurality of recesses in said upper edge of the second quadrant member, said side flanges, a second link means pivotally connected between said support frame member and said second quadrant member converting pivotal adjustment movement of the seat frame member into pivotal movement of the second quadrant member,

(f) two locking levers disposed along the base and between the side flanges of the inverted channel, each locking lever having a free end and being mounted for pivotal movement between the side flanges, the respective free ends of the two locking levers being releasably engageable with recesses of the first and second quadrants respectively thereby to lock each of the quadrants in a selected pivotal position,

(g) a control lever mounted on the seat frame member for rotation to a number of set positions, the control lever extending beneath both of said locking levers, a manually operable portion of the control lever, said manually operable portion extending to one side of the seat frame member, cam means on the control lever, the cam means including respective cam portions selectively engageable with the locking levers in said set positions of said control lever, a first set position of the control lever corresponding to one of the locking levers being raised by a cam portion to be out of engagement with said first quadrant, while the second quadrant remains engaged by its locking lever, and a second set position of the control lever corresponding to the other locking lever being raised by the other cam portion to lie out of engagement with the second quadrant, while the first quadrant remains engaged by its locking lever, free pivotal adjustment movement of the backrest frame member with the seat frame member being fixed being possible in said first set position, and free pivotal adjustment movement of the seat frame member with the backrest frame member being fixed being possible in said second set position, both the backrest and seat frame members being lockable in a selected position after adjustment by means of the locking levers and quadrants.

4,627,663

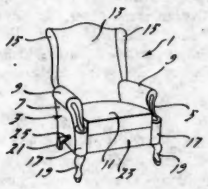
RECLINING CHAIR

Larry P. LaPointe, LaSalle, Mich., assignor to La-Z-Boy Chair Company, Monroe, Mich.

Filed Apr. 4, 1984, Ser. No. 596,689

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—316 **9 Claims**



1. A chair comprising a substantially rigid chair frame, means supporting the chair frame in a normally upright position on and relative to the floor, said chair frame including vertically extending left and right hand side members, a horizontally extending seat frame located between the side members, a normally vertically extending back frame at the rear of the chair frame and extending upwardly above the seat and chair frame, left and right hand rear swing links, first pivot means pivoting said rear swing links to said left and right hand side members respectively of said chair frame for pivoting about a rear horizontal axis located above said seat frame, second pivot means pivoting lower portions of said rear swing links to the left and right hand sides respectively of the seat frame at the rear thereof whereby the rear of said seat frame is supported and suspended by said rear swing links for pivotal movement about said horizontal axis, weight of the seat frame and of a chair occupant when not leaning against the back frame being centered forwardly of said rear horizontal axis and providing a moment tending to pivot the swing links on the first pivot means so that the second pivot means moves toward the rear of the chair, left and right hand front swing links pivoted respectively to left and right hand sides of said seat frame at the front thereof, said front swing links extending downwardly from the seat frame and being pivoted to said chair frame for pivoting about a front horizontal axis located below the seat frame, said seat frame being movable forwardly and upwardly on said front and rear swing links, means securing the back frame to said rear swing links above said rear horizontal axis and so that back pressure of a chair occupant on said back frame pivots said rear swing links on said first pivot means to produce recline movement of the back frame and corresponding forward and upward movement of the seat frame, said back frame and rear swing links being movable together between a position wherein the back frame is upright and a position wherein it is fully reclined, left and right hand counterbalance coil tension springs connected between said chair frame and the respective front swing links to be energized by movement of the front swing links and to provide spring assistance to return movement of the back frame toward an upright position, and left and right hand spring connector link means operatively connecting respectively the front ends of said counterbalance springs to the left and right hand front swing links adjacent the tops thereof and serving to reduce the amount of extension of the springs as compared with that which would occur if the springs were anchored directly on the front swing links.

4,627,664

SEAT ASSEMBLY

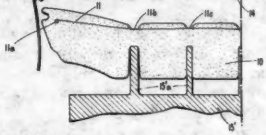
Hiroshi Okazaki, and Motoi Hyodo, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Oct. 21, 1983, Ser. No. 544,054

Claims priority, application Japan, Oct. 28, 1982, 57-189872

Int. Cl.[4] A47C *7/18*; B32B *3/06, 5/18*

U.S. Cl. 297—452 **6 Claims**



1. A seat assembly having a seat cushion comprising:

a seat pad having an outer surface;

a pair of support members embedded within said seat

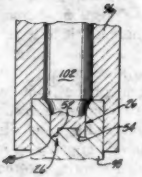
a net embedded within said seat pad and extending along a substantial portion of said seat pad between said pair of support members, said net including predetermined sections extending along said outer surface and being formed of a heat weldable material; and

a seat cover enveloping a portion of said outer surface, said predetermined sections of said net being welded to said seat cover.

4,627,665
COLD-HEADED AND ROLL-FORMED PICK TYPE CUTTER BODY WITH CARBIDE INSERT

Paul E. Ewing, Farmington Hills, Mich., and B. Randall Grubb, Everett, Pa., assignors to SS Indus., Plymouth, Mich. and Kennametal, Inc., Latrobe, Pa.

Filed Apr. 4, 1985, Ser. No. 719,764
Int. Cl.[4] E21C *35/18*; B21K *5/01*
U.S. Cl. 299—79 **7 Claims**



1. The method of making a bit comprising a cutter body and a carbide insert having a cylindrical base and a cutting tip with an annular beveled seating flange between the base and the tip, said cutter body being of the type comprising a unitary steel body including a cylindrical shank for supporting said bit and a conical head with a socket in the end thereof adapted to receive said insert, said method comprising the steps of:

cold-heading a cylindrical steel blank to provide an intermediate blank with a cylindrical shank and a conical head with a socket in the forward end of the head, said cold-heading including the steps of squaring-up the forward end of said blank by cold-heading thereof into cylindrical shape with a flat forward end, preforming said blank with a conical recess on the forward end thereof by a forming die working against the forward end of said blank, and punching a cylindrical hole into the central portion of said conical recess leaving an annular beveled seating surface surrounding said hole,

reducing said cylindrical shank by roll-forming to provide a neck defining a first annular groove in the shank,

reducing said cylindrical shank by roll-forming to provide a neck defining a second annular groove between the head and said first annular groove,

and brazing the base and seating flange of said carbide insert to the socket.

5. A cutting bit comprising a cutter body and a carbide insert,

said cutter body comprising a unitary steel body including a cylindrical shank for supporting the bit and a conical head on said shank with a socket in the end thereof adapted to receive a carbide insert said socket comprising a cylindrical hole surrounded by a annular beveled seating surface, said steel body also including a cylindrical section between said shank and said head,

said unitary steel body being cold-headed to form said conical head with said socket in the end thereof and to form said cylindrical shank and cylindrical section, whereby said steel body comprises work-hardened steel,

said shank being roll-formed after being cold-headed to form an annular retaining groove in said shank,

said cylindrical section being roll-formed after being cold-headed to form an annular extraction groove in said section,

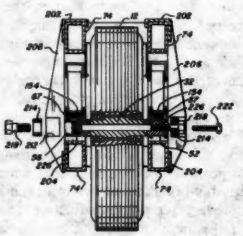
said socket being formed of densified, work-hardened steel as a result of said cold-forming and adapted to receive said carbide insert,

said carbide insert having a cylindrical base and a cutting tip with an annular beveled flange between the base and the tip, said cylindrical base being disposed in said hole with said flange disposed opposite said seating surface, and a brazed joint between said base and said socket and between said flange and said socket.

4,627,666
WHEEL ASSEMBLY

William B. O'Neill, P.O. Box 1144, Fort Morgan, Colo. 80701

Division of Ser. No. 417,355, Sep. 13, 1982, Pat. No. 4,511,303.
This application Apr. 12, 1985, Ser. No. 722,339
Int. Cl.[4] B60B *35/14*
U.S. Cl. 301—125 **6 Claims**



1. A wheel assembly including a hub adapted to be mounted to a wheel and connected to a frame, said wheel and hub generally enclosed by longitudinally extending structural members and laterally extending structural members of said frame comprising, in combination:

a generally cylindrical hub having a concentric bore therethrough and means thereon for connection to said wheel, said hub rotatable around an intermediate spindle between said longitudinal members, said intermediate spindle selectively and releasably connected at either end to an inner spindle and an outer spindle, respectively, said inner spindle and outer spindle connected to a leaf spring, which leaf spring is connected to said frame, whereby said wheel can be removed from said frame by disconnecting and spreading the inner and outer spindles from said intermediate spindle and lifting said intermediate spindle, hub and connected wheel vertically from said enclosure defined by said longitudinal and lateral members.

4,627,667
VEHICLE SUSPENSION ASSEMBLY

Fritz Mahnig, Schaffhausen, Switzerland, and Günter Schulte, Velbert, Fed. Rep. of Germany, assignors to Georg Fischer AG, Schaffhausen, Switzerland

Filed Jun. 25, 1984, Ser. No. 623,947
Claims priority, application Switzerland, Jun. 24, 1983, 3458/83
Int. Cl.[4] B60B *35/00*; B60G *3/20*
U.S. Cl. 301—126 **11 Claims**

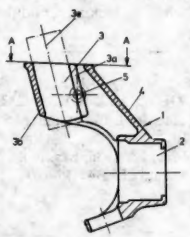
1. A swivel bearing, for use in connection with an axle unit and a shock absorber having a leg, of a vehicle suspension, comprising,

a wheel bearing housing,

engaging means adapted to engage a shock absorber leg, and a hollow, shaped connecting portion therebetween,

said engaging means including a hollow sleeve adapted to receive said shock absorber leg, and

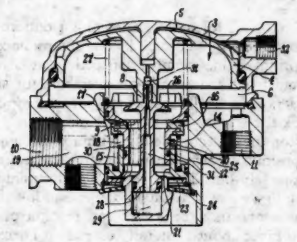
clamping means operable to tighten said sleeve around the shock absorber leg when said leg is positioned in said sleeve, said clamping means comprising oppositely disposed internal projection formed integrally with said sleeve, said internal projections defining a gap therebetween and dividing said sleeve into a first substantially circular hollow portion adapted to receive said shock absorber leg, and a second hollow portion, said sleeve and clamping means forming an unbroken enclosure about said shock absorber leg.



4,627,668
RELAY VALVE

John J. Camm, East Malvern, Australia, assignor to Repco Limited, Australia

Filed Sep. 17, 1984, Ser. No. 651,300
Claims priority, application Australia, Sep. 28, 1983, 1612/83
Int. Cl.[4] B60T *15/02*
U.S. Cl. 303—40 19 Claims

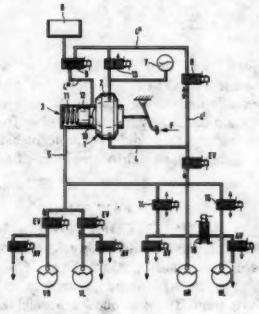


1. A relay valve for use in a vehicle brake system including, a hollow body, a main compartment within said body, an operating piston slidable within said compartment and dividing it into control and feed chambers, a control port connected to said control chamber, a plurality of outlet ports connected to said feed chamber, an inlet compartment formed within said body, an inlet port connected to said inlet compartment, an orifice through which said feed chamber communicates with said inlet compartment, a closure member mounted within said body for movement towards and away from a position at which it closes said communication through said orifice, means operatively connecting said closure member and said operating piston so that said closure member moves away from said communication closing position in response to movement of said operating piston in one direction, a damping chamber formed within said body, a damping piston slidable within said body and exposed to said damping chamber, passage means connecting said damping chamber to one of said control and feed chambers so that the pressure within that chamber acts on said damping piston to thereby cause resistance to movement of the operating piston in said one direction, said operating and damping pistons being connected to respective opposite ends of a rod which is coaxial with each said piston, and said passage means includes a passage extending axially within said rod.

4,627,669
SLIP-CONTROLLED BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

Juan Belart, Walldorf; Lutz Weise, Mainz, and Wolfram Seibert, Darmstadt, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 27, 1985, Ser. No. 706,154
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407537
Int. Cl.[4] B60T *8/44*
U.S. Cl. 303—114 2 Claims



1. A slip-controlled brake system for automotive vehicles having wheel brakes associated with front and rear axles, said system comprising, in combination:

a braking pressure generator having a master cylinder including at least one working chamber and having a pedal-actuated power brake booster connected to said master cylinder of said pressure generator;

an auxiliary pressure source connected to said brake booster;

a first hydraulic brake circuit connecting said brake booster to the wheels of one axle;

a second hydraulic brake circuit connecting said master cylinder to the wheels of the other axle; and,

first valve means for connecting said auxiliary pressure source and said working chamber of said master cylinder of said pressure generator during traction slip control; and,

second and third valve means, each connecting said second hydraulic brake circuit to a respective one of said wheels of said one axle during traction slip control.

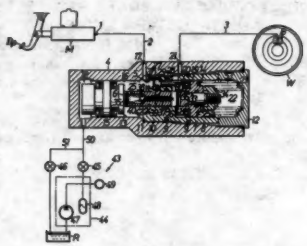
4,627,670
HYDRAULIC BRAKING PRESSURE CONTROL APPARATUS FOR VEHICLES

Shohei Matsuda, Utsunomiya, and Makoto Sato, Kamifukuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1985, Ser. No. 755,502
Claims priority, application Japan, Jul. 17, 1984, 59-148235; Jul. 17, 1984, 59-148237; Nov. 5, 1984, 59-232562
Int. Cl.[4] B60T *8/02*
U.S. Cl. 303—115 11 Claims

1. A hydraulic braking pressure control apparatus for vehicles, comprising: an input hydraulic chamber communicating with an output port of a master cylinder and an output hydraulic chamber communicating with a wheel brake and adapted to generate a hydraulic braking pressure corresponding to a hy-

draulic pressure in said input hydraulic chamber, said output hydraulic chamber being adapted to be enlarged in volume in accordance with a liquid pressure within a control chamber, which is adjusted by an anti-lock control means, when a vehicle wheel is about to be locked, wherein provided between said input and output hydraulic chambers are a first valve mecha-



nism adapted to be closed in response to an increase in the liquid pressure of said control chamber and a second valve mechanism adapted to be opened to prevent the hydraulic pressure in said output hydraulic chamber from being reduced below a set value when said hydraulic pressure in said output hydraulic chamber falls below the level of said set value.

4,627,671

ANTISKID CONTROL DEVICE

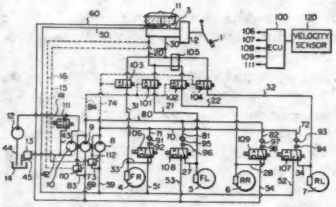
Kazuma Matsui, Toyohashi; Yoshiyuki Hattori, Toyoake; Yuichi Imani, Hamamatsu; Akira Kuno, Oobu, and Yoshihisa Nomura, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jodosha Kabushiki Kaisha, Toyota, both of Japan

Filed Oct. 28, 1985, Ser. No. 792,007

Claims priority, application Japan, Nov. 1, 1984, 59-228889; Feb. 6, 1985, 60-19837; Mar. 15, 1985, 60-53042; Jul. 2, 1985, 60-143856

Int. Cl.[4] B60T *8/04*

U.S. Cl. 303—116 **9 Claims**



1. An antiskid control device controlling pressure in wheel cylinders of a brake system provided in a vehicle for preventing the vehicle from skidding through locking of the wheels thereof, said device comprising;

a main line system having a first hydraulic source, a main line connecting said first hydraulic source to said wheel cylinders, and a cut-off valve provided in said main line to open and close said main line,

a means for switching said cut-off valve to normally open said main line, and to close said main line when a locking condition occurs in the wheels of the vehicle,

an oil hydraulic mechanism having an oil hydraulic source constantly generating a hydraulic pressure, an oil hydraulic motor rotating when said hydraulic pressure is transmitted from said oil hydraulic source, an oil hydraulic pump discharging a pressurized oil, a means for connecting said oil hydraulic motor to said oil hydraulic pump to drive said pump, and a means for transmitting the hydraulic pressure of said oil hydraulic source to said oil hydraulic motor when a locking condition occurs in the wheels,

a subline system having a subline connecting said hydraulic pump to said wheel cylinders, a switching valve provided in said subline to open and close said subline, and a means for releasing a pressurized oil in the wheel cylinder to outside thereof when said switching valve. is closed,

a means for controlling said switching valve to open or close said subline when a locking condition occurs in said wheels.

4,627,672

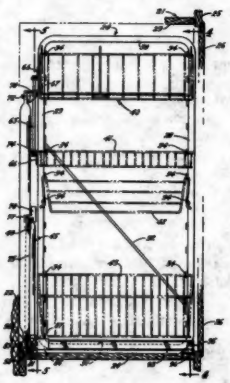
PULL-OUT RACK FOR A CABINET

William DeBruyn, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Mar. 18, 1985, Ser. No. 713,232

Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—331 **13 Claims**



1. A pull-out rack for a cabinet having a bottom wall and having a front opening, said rack having interconnected front and rear upright frame members spaced from one another, means on said front and rear frame members for supporting various holders in vertically spaced relation, and means mounting said rack for inward and outward movement between a stored position located completely within the cabinet and an accessible position in which substantially the entire rack is located completely outside the cabinet, said mounting means comprising a first pivot arm having upper and lower end portions, means supporting the lower end portion of said first pivot arm to pivot about a laterally extending horizontal axis located adjacent the rear end of the bottom wall of the cabinet, means connecting the upper end portion of said first pivot arm to said rack intermediate the ends of said rear frame member to slide upwardly and downwardly relative to said rear frame member and to pivot about a laterally extending horizontal axis relative to said rear frame member, said connecting means comprising an upright rod secured to and spaced rearwardly from the rear side of said rear frame member, a block slidable upwardly and downwardly on said rod, and a bracket fixed to the upper end portion of said first pivot arm and pivotally connected to said block, a second pivot arm having upper and lower end portions, means connecting the upper end portion of said second pivot arm to said first pivot arm intermediate the ends thereof to pivot about a laterally extending horizonal axis, means supporting the lower end portion of said second pivot arm to said rack adjacent the lower end portion of said rear frame member to pivot about a laterally extending horizontal axis, said pivot arms being upright and being collapsed adjacent one another with said second pivot arm disposed between said first pivot arm and said rear frame member when said rack is in said stored position, said pivot arms pivoting in opposite

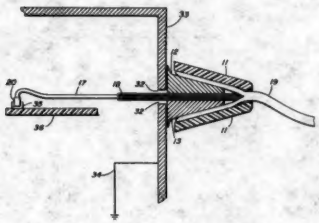
directions when said rack is pulled outwardly to said accessible position and expanding during such pivoting to cause a first triangle to be formed by said bottom wall, said second pivot arm and the lower section of said first pivot arm and to cause a second triangle to be formed by said rear frame member, said second pivot arm and the upper section of said first pivot arm, horizontal guide track means extending between said upper and lower frame members adjacent the lower ends thereof, and roller means mounted on the front end portion of the bottom wall of the cabinet to turn about a laterally extending horizontal axis and coacting with said track means to guide said rack for inward and outward movement between said stored and accessible positions.

4,627,673

GROUNDING AND STRAIN RELIEF CLAMP FOR FLAT CABLES

George H. Barrus, Jr., Dracut, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Dec. 20, 1985, Ser. No. 811,590
Int. Cl.[4] H01R *4/66*
U.S. Cl. 339—14 R **6 Claims**



1. A cable clamp for shielded, jacketed flat cables comprising

an insulated housing having a truncated wedge-shaped cavity with apertures at its narrow and wide ends for passage of flat electrical cable therethrough;

top and bottom wedge plates for insertion into the wide end of the cavity above and below a cable passing therebetween; and

means for mounting the clamp on an electrically grounded cabinet;

the dimensions of the wedge plate permitting an insulating jacket of a cable stripped from a the cable to be located between the sloped surface of a wedge plate and the sloped surface of the cavity to anchor the cable to the electrically grounded cabinet;

the flat bottom surfaces of the wedge plates in electrical contact with an exposed conductive layer of a cable.

4,627,674

TRI-LEAD CONNECTOR

Wilbur A. Hamsher, Jr., New Cumberland, and Raymond V. Pass, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 485,922, Apr. 18, 1983, abandoned. This application Jun. 12, 1985, Ser. No. 744,281
Int. Cl.[4] H01R *4/66*
U.S. Cl. 339—14 P **23 Claims**

21. An electrical connector for terminating signal and ground conductor means of tri-lead cable means for electrically connecting the signal and ground conductor means to a pin terminal and a ground rail respectively of a panelboard, comprising:

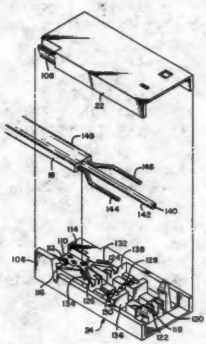
dielectric housing means having parallel passageway means extending therethrough which communicate with respective opening means at a front end of a housing means into which the pin terminal and the ground rail extend;

signal terminal means disposed along one of said passageway means and including contact means in alignment with the said respective opening means for the pin terminal for electrical connection therewith;

ground terminal means disposed along the other of said passageway means and including contact member means in alignment with the said respective opening means for the ground rail for electrical connection therewith;

terminating means provided by said signal and ground terminal means for respectively terminating the signal and ground conductor means thereto;

means in which said terminating means and said signal and ground conductor means terminated thereto are insulatively mounted, said insulative mounting means and said



housing means being adapted to allow limited axial movement relative to each other;

terminal-securing means on said signal and ground terminal means and said housing means securing said respective terminal means in said housing means and adapted to allow limited axial movement of said respective terminal means with respect to said housing means;

latching means on said signal terminal means which latchably engages the pin terminal when electrically connected therewith; and

means in said passageway means containing said signal terminal means engageable with said latching means when said housing means is moved axially relative to said terminal means thereby causing said latching means to be unlatched from the pin terminal enabling the connector to be disconnected from the pin terminal and the ground rail.

4,627,675

WIRING SYSTEM WITH QUICK CONNECT WIRE TERMINALS

Richard D. Taylor, and Phillip W. Stumpff, both of P.O. Box 802, Madill, Okla. 73446

Continuation-in-part of Ser. No. 520,237, Aug. 4, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 671,129
Int. Cl.[4] H01R *4/66*
U.S. Cl. 339—14 R **21 Claims**

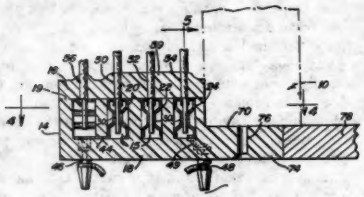
1. A plug-in electrical wiring apparatus, comprising:

an insulating housing, having a wire receiving housing opening disposed through a wall thereof; and

an electrical contact strip disposed in said housing, said strip including:

a middle web portion having a wire receiving web opening disposed therethrough in registry with said wire receiving housing opening, said web portion further including retaining means for engaging said wire when

said wire is inserted through said housing opening and said web opening and for resisting withdrawal of said wire from said web opening; and



first and second leg portions extending from said web portion away from said wall of said housing, said leg portions being arranged to receive said wire therebetween, such that said wire is grippingly engaged by said leg portions.

4,627,676

ELECTRONIC ASSEMBLY INCLUDING INTEGRATED CIRCUIT PACKAGE AND LIQUID CRYSTAL DISPLAY PANEL

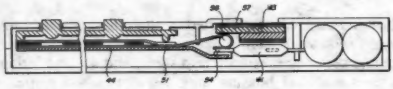
Tadashi Tomino, Yamatokoriyama, and Masayuki Higuchi, Ueno, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 349,925, Feb. 18, 1982, Pat. No. 4,508,402. This application Jul. 18, 1984, Ser. No. 632,038

Claims priority, application Japan, Feb. 27, 1981, 56-29250; Apr. 9, 1981, 56-54066; Sep. 30, 1981, 56-157151

Int. Cl.[4] H05K *11/00*

U.S. Cl. 339—17 CF **1 Claim**



1. An assembly comprising:

display means having external terminals;

integrated circuit means having a plurality of external signal terminals arranged at a single side thereof, such that said external signal terminals are overlapped with said external terminals of said display means;

flexible citcuit board means carrying a wiring pattern for providing signals into said integrated circuit means; and

elastic engagement means comprising an electrically conductive material electrically and mechanically connecting said external terminals of said display means and on end of said wiring pattern of said circuit board means against said external signal terminals of said integrated circuit means.

4,627,677

FLEXIBLE CURRENT FEEDING POST

Izumi Ono, Hachioji; Iwami Manago, Yokohama; Haruo Takayama, Sagamihara, and Yasuo Takahashi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 29, 1985, Ser. No. 738,864

Claims priority, application Japan, May 31, 1984, 59-111280; Dec. 18, 1984, 59-192545

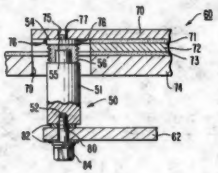
Int. Cl.[4] H01R *9/09*

U.S. Cl. 339—17 M **9 Claims**

1. A flexible current feeding post for mechanically and electrically interconnecting first and second substrates at respectively corresponding, predetermined contact surfaces thereof, to maintain the substrates in substantially parallel and nominally predetermined, spaced relationship and to feed current from the contact surface of one of said substrates to the contact surface of the other of said substrates, comprising:

a metal post of a first predetermined axial length having first and second ends and defining a central axis, said first end having a coaxial, threaded bore for positioning in alignment with an aperture in a corresponding contact surface of the first substrate, the aligned said aperature and bore being adapted to receive a screw therethrough for rigidly securing said first end of said post to the corresponding contact surface of the first substrate, and said metal post further having a cylindrical extension of a second predetermined axial length extending coaxially from said second end of said post and having a free end;

a conductive, flexible bellows of a nominal third predetermined axial length greater than the second predetermined axial length and having first and second ends, said bellows being received coaxially about said cylindrical extension and secured at said first end thereof to said second end of said metal post, with said second end of said bellows extending beyond said free end of said cylindrical extension by a nominal, predetermined amount corresponding to the difference between the second and third axial lengths;



a solid conductive disc having first and second, generally parallel, spaced planar surfaces disposed transversely to the central axis and coaxially with said bellows, said first planar surface of said disc being secured to said second end of said bellows and displaced thereby from said free end of said extension by the nominal, predetermined amount, and said second planar surface of said disc having a central projection extending coaxially therefrom for being received in an aperture extending through a corresponding contact surface of the second substrate thereby to align said second planar surface of said disc in contacting relationship with the associated contact surface of the second substrate, said second planar surface of said disc being adapted for being bonded to the corresponding contact surface of said second substrate; and

the first predetermined length of said metal post, the third, nominal predetermined length of said flexible bellows, and the thickness of said solid conductive disc defined by the spacing of said parallel planar surfaces thereof nominally defining the predetermined, spaced relationship between the first and second substrates.

4,627,678

ELECTRONIC PACKAGE ASSEMBLY AND ACCESSORY COMPONENT THEREFOR

Ranjit Biswas, Plainsboro, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 460,434, Jan. 24, 1983, Pat. No. 4,519,658. This application Feb. 20, 1985, Ser. No. 703,259

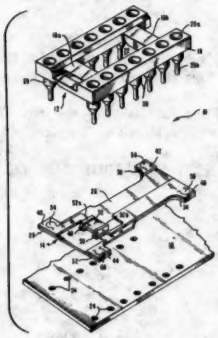
Int. Cl.[4] H01R *9/09*

U.S. Cl. 339—17 CF **6 Claims**

1. An accessory circuit for connection to an electrical package having an elongate housing and a plurality of extending contacts aligned along two transversely spaced longitudinally extending edges thereof, said circuit comprising:

a flat elongate planar conductive member having a plurality of openings aligned along two transversely spaced longitudinaly extending edges thereof for corresponding

alignment with and receipt of said contacts of said package, said conductive member further including a plurality of apertures aligned in two transversely spaced longitudinally extending rows, substantially parallel to and spaced transversely inwardly from said openings, said apertures defining a connection region between said apertures and said longitudinal edges of said conductive members inclusive of said openings, portions of said connection region



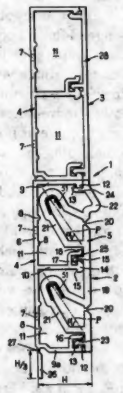
being selectively removable, to thereby define plural connection extents for engagement with plural selected contacts of said package, said conductive member further including a central region between said rows of apertures defining a conductive path between said central region and said connection extents, portions of said central region being selectively removable to create an open electrical circuit between said central region and said connection extents.

4,627,679

CONTINUOUS-ACCESSIBILITY ELECTRICAL CONDUITS

Philippe M. Billette de Villemeur, Paris; Gerard L. Pournain, Mortain, and Louis A. Cahu, Ducey, all of France, assignors to Etablissements A. Gregoire & Barilleau, Maisons Alfort, France

Filed Nov. 21, 1984, Ser. No. 673,710
Claims priority, application France, Nov. 21, 1983, 83 18492
Int. Cl.[4] H01R *25/14*
U.S. Cl. 339—21 R **18 Claims**



1. Continuous - accessibility electrical conduit designed to contain at least two electrical conductors and to have the appearance of a plinth or molding, when mounted on a wall or similar structural surface, comprising:

a base means in the form of a case (**4**; **30**) having a back wall (**6**) and two lateral walls (**9**, **9*a***), each joined at a first end to said back wall and having a second end free, and defining a substantially U-shaped cross-section with an open portion, said base means being adapted to be fastened onto a structural surface, the case further comprising longitudinal interior partition means (**10**) having a first end attached to the back wall and having a second end free, said interior partition means delimiting individual compartments (**11**);

cover means (**5**; **31**; **37**) adapted to be mounted to said base means and to close said open portion of the case, said cover means comprising a non-conducting material having a front surface and in a first cover configuration at least two narrow, parallel longitudinal access means (**21**), each access means having a slot (**20**), each access means being adapted to contain an electrical conductor and each access means being adapted to fit into a respective one of said individual compartments; and snap lock means (**12**, **23**, **24**; **14**, **25**; **39**, **39*a***) provided on the longitudinal free end of said interior partition means, and provided longitudinally on the cover means in a location opposite to said longitudinal free ends of said lateral walls and interior partitions means of the case, when said cover means is mounted on said base means;

and further characterized in that adjoining snap lock means are separated by a distance which alternatively is less than or greater than a constant value;

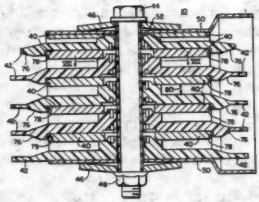
whereby, when said cover means is mounted on said base means with said snap lock means, each electrical conductor is enclosed in a non-conductive compartment and is electrically insulated from each adjoining electrical conductor and each compartment is substantially rigid and mechanically closed over the entire length of the two longitudinal free ends of said lateral walls and said interior partition means defining said compartments.

4,627,680

BRIDGING JOINT FOR ELECTRIC POWER BUSWAY

Charles L. Weimer, Patterson Heights, and Barry R. Richards, Beaver, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 8, 1985, Ser. No. 731,698
Int. Cl.[4] H01R *11/00*
U.S. Cl. 339—22 B **10 Claims**



1. A busway joint construction for electrically connecting busway sections together, comprising:

a pair of busway sections;

at least one elongated bus bar supported in each section with the end portion of one bus bar being spaced from the end portion of the other bus bar;

joint means for electrically connecting the spaced end portions and including a joint assembly of spaced plates, one plate being a conductor and the other plate being an electrical insulator;

the plates having aligned apertures and surrounding facing

surfaces for clamping contact with the end portions of both bus bars;

one of the plates having a spacer collar around the aperture which collar has a support surface engaging the facing surface of the other plate; and

clamping means extending through the aligned apertures for clamping the bus bar portions in good electrical contact with the conductor plate.

4,627,681

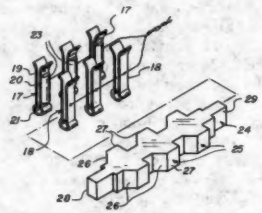
LOCKING ELECTRICAL CONNECTOR

Douglas Hong, 12106 Rustic Hill Dr., Bowie, Md. 20715

Filed Feb. 15, 1985, Ser. No. 702,270

Int. Cl.[4] H01R *13/631*

U.S. Cl. 339—75 P **3 Claims**



1. A locking, multiple socket female electrical connector for extension cords, appliances and the like, comprising:

an elongate body of electrically non-conductive material having a longitudinally extending passage therethrough defined by spaced apart side walls, said body having inwardly projecting shoulders formed thereon at opposite ends of the passage, defining stops around reduced diameter guide openings at the opposite ends of the passage;

a plurality of generally U-shaped female contacts carried by the body on opposite sides of the passage and spaced uniformly apart along the length of the passage, said contacts each comprising a pair of spaced apart legs joined at one end by a bight portion and being inherently resiliently biased to said spaced apart position, a first leg and the bight portion of each contact being fixed in the material of the body and the second leg of each contact being disposed substantially in the plane of the passage side wall, each said second leg having a rounded cam guide surface formed thereon on the side toward the passage, said cam guide surface extending throughout substantially the entire length of the leg; and

an elongate, one-piece wedge member longitudinally slidable in said passage, said wedge member having a cross-sectional dimension less than the cross-sectional dimension of the passage, and having a plurality of inclined cam surfaces on opposite sides thereof, each terminating at one end in a recessed portion of the wedge member and terminating at the other end in a generally flat wedging surface disposed closely adjacent and parallel to the side wall of the passage in a position to engage the cam guide surfaces on said second legs of the contacts and urge said second legs toward the first legs of each contact, said wedge member having opposite end portions projecting through the reduced diameter guide openings, defining combination guides and actuators extending beyond the end of the body, the length of the wedge member, including the actuators, being such that when the actuator at one end of the wedge member projects from the body, the actuator at the other end of the wedge member is substantially flush with the end of the body, said wedge member having stop surfaces formed at the inner or base ends of the actuators for engaging the stops formed in the body to limit axial movement of the wedge member so that when the wedge member is in an unlocked position the recesses thereof are in registry with said contacts so that the legs of the contacts are in their at-rest spaced apart position, and when the wedge member is in a locked position the wedging surfaces thereon are in engagement with the cam guide surfaces on said second legs, urging the second legs toward the first legs for securely gripping a male electrical contact when inserted between the legs of the female contact.

4,627,682

MULTI-PIN MALE AND FEMALE CONTACT BARS

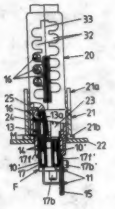
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Jul. 30, 1984, Ser. No. 635,539

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327387

Int. Cl.[4] H01R *4/24, 4/02*

U.S. Cl. 339—99 R **5 Claims**



4. A pluggable multi-pin contact bar for the connection of a large number of narrowly spaced electrical leads of a printed circuit board or of a flat ribbon cable to the leads of a mating multi-pin contact bar, the pluggable contact bar comprising in combination:

an elongated block-shaped horizontal contact post housing of injection-molded plastic material, the housing having opposite upper and lower longitudinal sides;

at least one row of contact post apertures extending vertically through the contact post housing and defining a vertical contact post center plane, the contact post apertures being spaced at a regular longitudinal pitch;

vertical conatct posts engaged in the contact post apertures of the contact post housing; and

means for vertically seating the contact posts in their contact post apertures; and wherein

each contact post includes an upper contact post portion in the form of a U-shaped female contact member defined by a pair of substantially parallel vertical tines on opposite sides of and equidistant from a vertical contact post center plane and a transverse web portion joining the vertical tines at their lower extremities, the two vertical tines having converging upper end portions adapted to receive between them a male plug pin, while being forcibly separated by said plug pin, the upper contact post portion yielding resiliently to permit said separation, while applying a pinching contact force against said plug pin;

each contact post further includes a lower contact post portion in the form of a cable-penetrating contact member of U-shaped outline with a pair of substantially parallel vertical tines and a transverse web portion joining the two tines at their upper extremities, the two vertical tines defining two yoke-shaped contact blades with transversely aligned vertically oriented central blade slots which are open at the lower extremity of the contact blades, where they form a diverging entry taper; and

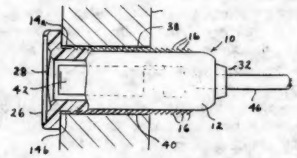
the web of the lower contact post portion is butt-welded to the web of the upper contact post portion.

4,627,683

ELECTRICAL OUTLET

Kiyosji Shimomura, Tokyo, Japan, assignor to Rainbow Trading Co., Inc., New York, N.Y.

Filed Aug. 7, 1984, Ser. No. 638,662
Int. Cl.[4] H02B 1/04
U.S. Cl. 339—128 8 Claims



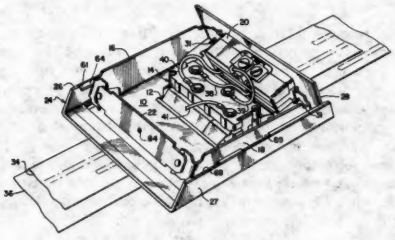
1. A self-contained electrical outlet for mounting within a cut out through a furniture panel or the like comprising: a resilient, flexible body portion having at least one axial surface thereon positionable adjacent one planar surface, said planar surface being one of the walls of said cut out; at least one deflectable detent formed on said axial surface, said detent movable between an initial position and a further position; said detent being moved from its initial position towards said further position as said outlet is moved through said cut out in a first direction and said detent engages said one planar surface and said detent moves towards said initial position to engage said one planar surface in such a way that a tip of said detent is in frictional contact with said planar surface, said planar surface being the only surface said detent is in contact with, to prevent withdrawal of said outlet from said cut out when forces are placed on said outlet in a second direction opposite said first direction; at least one set of receptacle terminals mounted in said outlet to mechanically and electrically engage the prongs of an electrical plug and connection means coupled said receptacle terminals and adapted to be coupled to a source of electrical energy.

4,627,684

HOUSING FOR ELECTRICAL CONNECTORS

Michael J. D'Amato, North Haven, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jul. 23, 1984, Ser. No. 633,467
Int. Cl.[4] H01R 13/46
U.S. Cl. 339—206 R 5 Claims



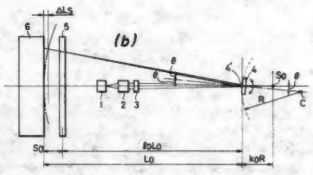
1. An electrical connector housing comprising
a first lower housing portion having
a generally rectangular base frame having a central opening therethrough,
first and second side walls extending upwardly from opposite sides of said base frame and
terminating at upper edges, and
a first end wall sloping inwardly and upwardly from a third side of said base frame beyond said upper edges, said end wall having means defining openings therethrough to provide access to an electrical connector device and an attachment hole;
a second upper housing portion having
a generally rectangular top plate,
third and fourth side walls extending downwardly from opposite side edges of said top plate and terminating at lower edges, and
a second end wall sloping downwardly and outwardly from a third edge of said top plate beyond said lower edges; and
means on said upper and lower housing portions for coupling said portions together to form a closed housing ends and with said first and second end walls at opposite ends and with said upper and lower edges of said side walls in substantially contiguous, abutting relationship, said means for coupling including
hook means on one of said housing portions extending beyond the edges of the side walls of said one portion; and
means defining inwardly opening grooves extending longitudinally along the inner surfaces and adjacent the edges of the side salls of the other housing portion for receiving said hook and permitting relative sliding motion of said upper and lower housing portions between a closed position in which said second end wall is adjacent the fourth side of said base frame and said first end wall is adjacent the fourth edge of said top plate and an open position in which said first end wall is spaced from said top plate to permit access to the interior of said housing, said grooves including
stop means for establishing the relative locations of said housing portions in said open position, and
upwardly extending grooves for receiving said hook means approaching in a downard direction.

4,627,685

POST-OBJECTIVE TYPE SCANNING DEVICE

Nobuo Sakuma, str.add-No. 1283, Higashi-naganuma, Inagi-shi, Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 683,880
Claims priority, application Japan, Dec. 22, 1983, 58-240861
Int. Cl.[4] G02B 26/10
U.S. Cl. 350—6.8 4 Claims



1. A post-objective type scanning device having reduced image surface curvature comprising a deflector whose reflection surface is a convex spherical surface having a radius R or a cylindrical mirror, a photosensitive surface in which a light beam deflected by said deflector scans and a cylindrical optical element installed in the neighbourhood of said photosensitive surface, characterized in that if the radius of said deflector is R and the relation of $L_0=L_\theta$ is present, where L_o is the length from the deflecting point to the scanning surface when the rotational angle of the deflector is O and L_θ is the length from the deflecting point to the scanning surface at said rotational angle θ, the following relation is established:

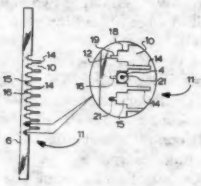
$$R=\{(1/\cos\theta)+\cos\theta/(1+\cos\theta)-1\}L_o.$$

4,627,686

SPLICING TRAY FOR OPTICAL FIBERS

Otto I. Szentesi, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

Filed Aug. 10, 1984, Ser. No. 639,585
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 7 Claims



1. A splicing tray for optical fibers and fiber optic cable comprising:

(a) a base;

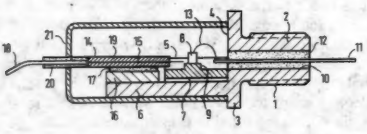
(b) optical fiber receiving means attached to the base including a slot having a median and two terminal portions, each of said terminal and median portions delimited by two upstanding sidewalls, only the sidewalls of the terminal portions having first, second and third portions, each of said first, second and third portions being spaced apart from and respectively paired opposite from a like first, second and third portion of an adjacent sidewall to form sidewall pairs delimiting first, second and third slots, all of such slots in communication with one another, all having predetermined bottoms and widths, the width of the first slot being less than the width of the second slot and the width of the second slot being less than the width of the third slot, the bottom of the first slot being spaced apart from the bottom of the second slot and the bottom of the second slot being spaced apart from the bottom of the third slot, the median portion of the first-mentioned slot being delimited only by opposing third portions of the sidewalls wherein each first slot is adapted to grasp a first buffered optical fiber when a buffered optical fiber is inserted therein and each second slot is adapted to grasp a second buffered optical fiber when a second buffered optical fiber is inserted therein, said second buffered optical fiber having an outer diameter greater than the outer diameter of said first buffered optical fiber.

4,627,687

DEVICE FOR HOLDING IN POSITION A TRANSDUCER AND AN OPTICAL WAVEGUIDE

Reimund Dorn, Schwieberdingen; Heinz Ebner, Ditzingen; Johann Gundert, Korntal; Ernst Halder, Renningen; Werner Haspel, Stuttgart; Ingo Isert, Bietigheim-Bissingen; Gunter Kuhnemann, Vaihingen/Enz; Felix Lutz, Stuttgart; Gerhard Seibold, Remseck, and Gerhard Wessel, Stuttgart, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 27, 1984, Ser. No. 584,177
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307465
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 6 Claims



1. A device holding in position an electrical-to-optical or optical-to-electrical transducer and an optical waveguide ending in front of said transducer and having improved separation of heat flow between the transducer and the waveguide comprising:

a bolt having on one end thereof a first supporting member for said transducer and a second supporting member for said waveguide, said bolt having a longitudinal axis;

a protective cap on said one end of said bolt enclosing said supporting members, transducer and the waveguide;

said second supporting member comprising a semi-cylindrical shell having an extended supporting arm and said shell having slots which extend along the longitudinal sides of said supporting arm;

a guide sleeve containing said waveguide mounted on said arm concentric with said axis;

said transducer intersecting said axis;

said first supporting member having a substantially flat body and having longitudinal sides mounted in said shell and having a flat bottom spaced from said shell providing an air gap therebetween whereby the slots and the air gap separate the heat flow between said first supporting member and said second supporting member;

a bore extending through said bolt;

a conductor extending through said bore and insulated from said bolt, and

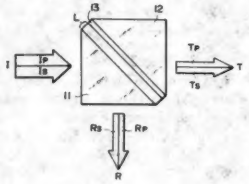
means making electrical connection between said conductor and said transducer.

4,627,688

BEAM SPLITTER

Takeshi Kobayashi; Kazuo Endo; Nobumasa Nanbu, and Yoshizi Kawamura, all of Sano, Japan, assignors to Sano Kiko Co., Ltd., Japan

Continuation of Ser. No. 510,287, Jul. 1, 1983, abandoned. This application Nov. 20, 1985, Ser. No. 800,095
Int. Cl.[4] G02B 27/14
U.S. Cl. 350—173 13 Claims



1. A beam splitter consisting essentially of a transparent substrate having a refractive index N_S, one or more low refractive index film layers, each low refractive index film layer having a refractive index N_L higher than said refractive index N_S, and one or more high refractive index film layers, each high refractive index film layer having a refractive index N_H higher than said refractive index N_L, whereby $N_S<N_L<N_H$, said low refractive index film layer and said high refractive index film layer being alternately stacked on said transparent substrate in such a manner that the uppermost film layer of the stack is the low refractive index film layer.

4,627,689

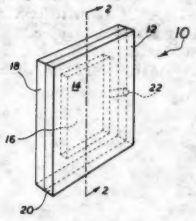
CRYSTALLINE COLLOIDAL NARROW BAND RADIATION FILTER

Sanford A. Asher, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed Dec. 8, 1983, Ser. No. 559,437
Int. Cl.[4] G02B 26/00, 5/18
U.S. Cl. 350—362 21 Claims

1. A filtering device for separating a narrow wavelength band from a broader spectrum of electromagnetic radiation comprising

a crystalline colloidal structure having a pair of substantially planar and parallel outer surfaces, said crystalline colloidal structure having a lattice structure which has a lattice spacing and a degree of order sufficient to Bragg diffract



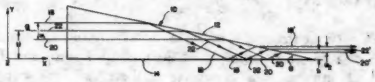
greater than about 90% of the intensity of a 200 Å wavelength band of the broader spectrum while passing greater than about 50% of the intensity of wavelengths adjacent to said wavelength band.

4,627,690

OPTICAL SYSTEM WITH ANAMORPHIC PRISM

Stephen D. Fantone, Saugus, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 8, 1985, Ser. No. 709,921
Int. Cl.[4] G02B *13/10*
U.S. Cl. 350—421 **8 Claims**



1. An optical system for effecting changes in the cross-sectional dimension of a beam of light along one of two mutually perpendicular cross-sectional axes thereacross comprising:

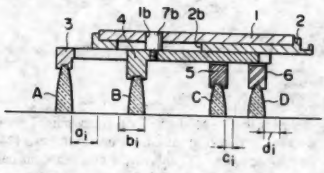
at least one optical prism comprising first and second substantially planar polished surfaces inclined to one another at an acute angle, said acute angle being subtended by a third substantially planar polished surface positioned to receive the incident beam of light, said first planar surface being inclined with respect to said third planar surface such that the beam of light incident to said third planar surface thereafter impinges upon said first planar surface at an angle of incidence at least equal to or greater than the critical angle of incidence so as to be internally reflected therefrom, said second substantially planar surface being inclined with respect to said first and third substantially planar surfaces such that the beam of light internally reflected by said first planar surface thereafter impinges upon said second planar surface at an angle of incidence at least equal to or greater than the critical angle of incidence so as to be internally reflected therefrom back toward said first substantially planar surface at an angle of incidence less than the critical angle of incidence thereby resulting in the beam of light being refracted at said first substantially planar surface as it exits from said optical prism, the cross-sectional dimension of the exiting beam being reduced along one of two mutually perpendicular cross-sectional axes thereacross.

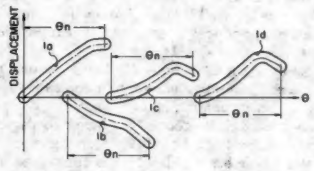
4,627,691

CAM GROOVES FOR DISPLACING LENSES

Yasumasa Tomori, Sakado, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 597,206, Apr. 6, 1984, abandoned, which is a continuation of Ser. No. 212,140, Dec. 2, 1980, abandoned. This application Dec. 17, 1984, Ser. No. 682,808
Claims priority, application Japan, Dec. 4, 1979, 54-156378
Int. Cl.[4] G02B *15/00*
U.S. Cl. 350—429 **3 Claims**





1. A method determining the loci of a plurality of cam grooves associated with a plurality of lenses of a lens system for guiding said plurality of lenses for movement relative to each other over a total focal length of the lens system, said method comprising:

(a) dividing said total focal length into a plurality of minute ranges;

(b) determining the displacement distances of said lenses over each of said minute ranges;

(c) selecting a fixed maximum lead angle for said lens system;

(d) selecting a lens of said lens system which experiences maximum displacement distance in one of said minute ranges;

(e) for said one minute range, determining an angle of rotation based on said fixed maximum lead angle and maximum displacement displacement distance of said selected lens;

(f) setting the loci of the cam groove associated with said selected lens at said fixed lead angle and for a distance determined by said angle of rotation to effectively position said selected lens in said one minute range;

(g) for said one minute range, setting the loci of the remaining cam grooves associated with the remaining lenses at lead angles equal to or less than said fixed maximum lead angle and for distances determined by said angle of rotation to effectively position the remaining lenses; and

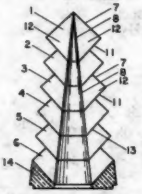
(h) repeating steps (d) through (g) for each of the remaining minute ranges to set the loci of all cam grooves of said lens system so loci as said fixed maximum lead angle is present in all minute ranges over the total focal length of the lens system.

4,627,692

LOUVERED CONICAL BEAM CONCENTRATOR RT:C

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Jun. 12, 1985, Ser. No. 743,831
Int. Cl.[4] G02B *13/18*
U.S. Cl. 350—432 1 Claim



1. A louvered conical beam concentrator RT:C comprising six component lenses (1–6) aligned on the vertical optic axis of the concentrator and mounted on an annular base (14);

upper component lens (1) having a convex conical section (7) which forms the apex of the concentrator, a concave conical section (8), an opaque lower convex conical wall (11), and twelve opaque radial walls (12),

lower component lenses (2–6) each having a convex conical section (7), a concave conical section (8), an opaque lower convex conical wall (11), twelve opaque radial walls (12), and an upper concave conical wall (13) parallel and opposed to lower wall (11),

said convex conical sections (7) being so disposed as to receive and transmit a convergent conical incipient beam (9) of diffused sunlight, and

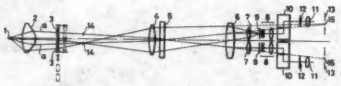
said concave conical sections (8) being so disposed as to receive and refract beam (9), forming a concentrated circular whole beam (10) which is emitted parallel to the vertical optic axis.

4,627,693

TRANSMISSION TYPE ILLUMINATING DEVICE FOR STEREOMICROSCOPES

Yoichi Iba, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1984, Ser. No. 672,355
Claims priority, application Japan, Nov. 22, 1983, 58-220261; Nov. 22, 1983, 58-220262; Nov. 22, 1983, 58-220263
Int. Cl.[4] G02B *21/06*
U.S. Cl. 350—523 12 Claims



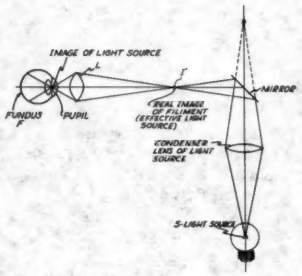
1. A transmission type illuminating device for stereomicroscopes comprising a light source, a collector lens, a pair of light source image forming lenses located in positions symmetrical with respect to the optical axis of said collector lens and a light source image relay lens arranged on the optical axis of said collector lens, said light source, collector lens, light source image forming lenses and light source image relay lens being arranged in the order mentioned above, said light source being in a position conjugate with a sample placing surface with respect to said collector lens and relay lens, and said pair of light source image forming lenses being so arranged that their respective optical axes can be positioned such that they coincide respectively with a pair of rays from said light source to intersect at said sample placing surface, a pair of observation optical systems including means defining a pair of entrance pupils of the stereomicroscope, said light source image relay lens and said pair of observation optical systems being positioned such that a pair of light source images produced by the pair of light source image forming lenses are conjugate with respect to the entrance pupils of said observaation optical systems.

4,627,694

INDIRECT OPHTHALMOSCOPY LENS FOR USE WITH SLIT LAMP BIOMICROSCOPE

David Volk, 3366 Kersdale Rd., Pepper Pike, Ohio 44124

Filed May 1, 1985, Ser. No. 727,764
Int. Cl.[4] A61B *3/14, 3/10;* G02B *13/18*
U.S. Cl. 351—214 10 Claims



1. A symmetrical biconvex aspheric indirect ophthalmoscopy lens of homogeneous transparent optical material for use with the slit lamp biomicroscope, each coaxial surface of said lens being a surface of revolution having an apical umbilical point at which the derivative of curvature vanishes, the magnitude and shape of each of the identical surfaces defined by the polynomial:

$$y=(Ax+Bx^2)^{\frac{1}{2}}+Cx^{(p)}+Dx^{(q)}+Ex^{(z)}\ldots,$$

where A is twice the apical radius of curvature of each surface, values of A ranging from about 20 mm to 7 mm, and B is (e^2-1), e being the apical eccentricity of each surface with the value of e being within the range of 1.1 to 1.7, and C, D, and E are coefficients of successive terms in the polynomial, the range of values of each of said coefficients being from 0 to about 500 in integral or fractional amounts, and p, q, and z are exponents in said successive terms with values ranging integrally or fractionally from 0 to 8.

4,627,695

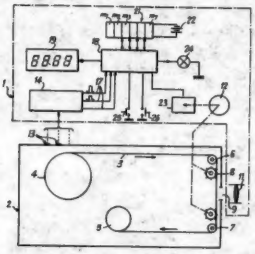
DEVICE FOR AUTOMATICALLY METERING AND DISPLAYING THE FOOTAGE OF DELIVERED FILM CONTAINED IN EACH OF A PLURALITY OF INTERCHANGEABLE MAGAZINES ADAPTED TO BE MOUNTED ON THE BODY OF A CINEMATOGRAPHIC CAMERA

Jean-Pierre Beauviala, Grenoble, and Jean-Pierre Charras, Brignoud, both of France, assignors to Societe Anonyme dite: Aaton Rg., Grenoble, France

Filed Oct. 7, 1985, Ser. No. 784,895
Claims priority, application France, Oct. 8, 1984, 84 15392
Int. Cl.[4] G03B *23/02*
U.S. Cl. 352—72 5 Claims

1. A device for automatically metering and displaying the footage of delivered film contained in each of a plurality of interchangeable magazines adapted to be mounted on the body of a cinematographic camera comprising, on each magazine, an assembly of coded identification marks peculiar to each magazine and, on the body of the camera, a device for reading and identifying the various assemblies of coded marks borne by the various magazines, a memory with a plurality of zones allo-

cated respectively to the various magazines and permanently containing information relative to the footage of film consumed in each magazine, a microprocessor receiving signals coming from the device for identifying the magazines, as well



as a metering pulse emitted by a pulse generator coupled to the motor driving the film and emitting a pulse for each image, and a display device connected to the microprocessor for indicating at any moment the footage of film delivered and contained in the magazine used.

4,627,696

PROJECTION APPARATUS

Friedrich-Josef Sacher, Agnesstrasse 52a, 5210 Troisdorf, Fed. Rep. of Germany

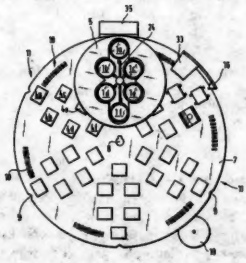
PCT No. PCT/EP83/00318, § 371 Date Jul. 26, 1984, § 102(e) Date Jul. 26, 1984, PCT Pub. No. WO84/02200, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 29, 1983, Ser. No. 638,471

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244394

Int. Cl.[4] G03B *23/10, 23/16*

U.S. Cl. 353—110 **18 Claims**



1. A projection apparatus for transparencies, comprising at least four projectors each including a projection lamp, a condensor and an objective and arranged to point at the same part of a picture screen, said projectors being offset from one another, said objectives and said condensors having axes which are transversely offset from one another so as to project on the picture screen pictures in register, said projection lamps being adjustable in their brightness independently of one another; a common lamp support arranged to support said projection lamps and being readily replaceable; a flat disc for supporting a plurality of transparencies with offset similar to said projectors, said disc having a central axis and being rotatable about said central axis, said disc being subdivided into a plurality of substantially equal sectors each arranged for supporting a group of at least four transparencies to be associated with said four projectors; an objective support supporting said objectives of said projectors with offset relative to one another; a condensor support supporting said condensors of said projectors with offset which is similar to the offset of said objectives; and an elective drive for driving said disc for supporting the transparencies about said central axis.

4,627,697

BACKGROUND PROJECTION SYSTEM FOR PHOTOGRAPHY

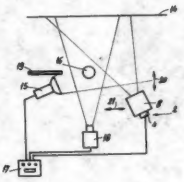
Paul Second, 251 "Les Erables" La Duchere, Lyon, France

Continuation of Ser. No. 654,790, Sep. 26, 1984, abandoned. This application Jan. 15, 1986, Ser. No. 819,987

Claims priority, application France, Sep. 26, 1983, 83 15734

Int. Cl.[4] G03B *15/00*

U.S. Cl. 354—77 **9 Claims**



1. A photographic apparatus comprising:

a backdrop;

a subject station located in front of said backdrop;

a camera trained on said subject station having an optical axis and a photographic field encompassing said station and at least a portion of said backdrop directly behind said station along said optical axis;

a background decor projector training a light beam upon said backdrop and at least upon said portion thereof without interception by said subject and from a location offset from said optical axis, said background decor projector comprising:

a flat Fresnel element having a working surface along which an object can be deposed to produce an image adapted to be projected on said backdrop,

a backdrop decor flash lamp for generating said light beam and positioned so that said light beam traverses said Fresnel element,

an objective lens unit disposed along an optical axis of said Fresnel element and receiving the light beam after it has passed said object, and

a mirror between said objective lens unit and said backdrop and out of the optical axis of said camera for reflecting an image of said object onto said backdrop so that the image on said backdrop is fully visible independently of a view finder of said camera; and

means for synchronously triggering said flash lamps and said camera to photograph said subject on a background formed by said image.

4,627,698

PROCESSING APPARATUS FOR PRINTING PLATES

Masahiro Yamasaki, Otsu; Masayoshi Wakabayashi, Inugami-gun; Jun Yamada, and Takao Senga, both of Nagaokakyo, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,351

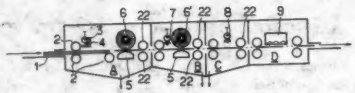
Claims priority, application Japan, Oct. 3, 1983, 58-185509

Int. Cl.[4] G03D *5/04*

U.S. Cl. 354—317 **6 Claims**

1. An apparatus for processing printing plates which have a base plate and an organic photoconductive layer on which a toner layer is electrophotographically fixed, the apparatus comprising: conveyor means for conveying said printing plate along a conveying path; supply means for supplying a processing solution evenly over the entire width of the upper surface

of said printing plate; and stirring means provided along said conveying path subsequent to said supply means, and arranged



so as to contact the processing solution on said printing plate without being contactable with said printing plate.

4,627,699

AUTOMATIC FOCUSING ADAPTOR FOR CAMERA LENS

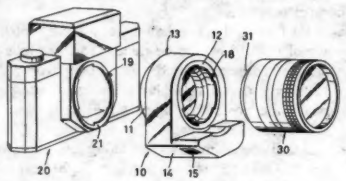
Tadao Takagi, Yokohama, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,320

Claims priority, application Japan, Jan. 31, 1984, 59-15510; Mar. 29, 1984, 59-61697; Apr. 19, 1984, 59-79063

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—400 10 Claims



1. In an automatic focusing unit to be interposed between a photographing lens and a camera body and having a lens system cooperative with the photographing lens to form an image of an object and driving means for moving said lens system in accordance with a detection signal from a focus detector so as to focus said object image on the focal plane, said camera body having a portion to be held by the right hand of the operator in a first direction on a plane perpendicular to the optical axis of said lens system, the improvement comprising:

(a) a cylindrical member having two ends one of which is connectable with the photographing lens and the other is connectable with the camera body and containing therein the lens system;

(b) a casing member for covering the outside of said cylindrical member excepting at least the two ends thereof; and

(c) focus locking means for acting on said driving means to retain the lens system at the position moved by said driving means, said focus locking means including an operation member for disabling said driving means, said operation member being provided on said casing member at such position which lies lower than the optical axis and shifted toward said first direction from the optical axis when the camera body and the automatic focusing unit are held with the optical axis and said first direction extending parallel with the horizontal plane.

4,627,700

FOCUS DETECTING AND INDICATING DEVICE FOR CAMERA

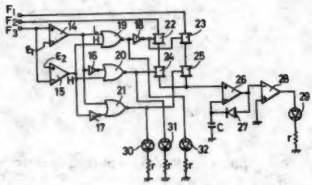
Kazuo Nakamura; Masao Jyojiki, both of Saitama, and Harumi Aoki, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1980, Ser. No. 117,931

Claims priority, application Japan, Feb. 15, 1979, 54-16445

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—409 6 Claims



1. In a camera of the type having a photographing lens which may be at an in-focus position, front-focus position or rear-focus position, an electrical focus detecting and indicating device of the type including means for generating a first focus detection signal (F1) having a maximum value at a front focus position of said lens, a second focus detection signal (F2) having a maximum value at a rear-focus position of said lens and a third focus-detection signal (F3) having a higher value on one side of said in-focus position than on the other side of said in-focus position, said electrical focus detecting and indicating device further comprising:

a first circuit (14–21) responsive to said third focus detection signal for providing output signals indicating the front, rear or in-focus position of said lens;

a second circuit (22–28) responsive to said first circuit output signals and to said first and second signals for providing an output signal indicating whether or not said photographing lens is moving in a direction toward said in-focus position; and

a display circuit (29) responsive to said second circuit output signal for displaying to a camera operator whether or not the photographic lens is presently moving toward said in-focus position.

4,627,701

CORONA DISCHARGER SYSTEM

Shigeyoshi Onoda, Yokohama; Akihiro Nomura, Kawasaki; Morikazu Mizutani, Tokyo; Shinji Kanemitsu, Ichikawa; Mototada Toriumi, Yokohama, and Fumio Nishino, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

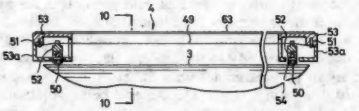
Division of Ser. No. 494,867, May 16, 1983, Pat. No. 4,575,221.

This application Oct. 4, 1985, Ser. No. 784,368

Claims priority, application Japan, May 20, 1982, 57-85608; Jul. 21, 1982, 57-127027; Sep. 30, 1982, 57-171905

Int. Cl.[4] G03G *15/02*

U.S. Cl. 355—3 CH 10 Claims



1. A corona discharger system comprising a corona wire; means for supporting both ends of the corona wire; a member movable into facing relation with said corona wire and having a surface which will hold an electrostatic latent image; and corona wire positioning member located between said surface

and the mounted corona wire and always biased toward said surface by the tension of said wire.

4,627,702

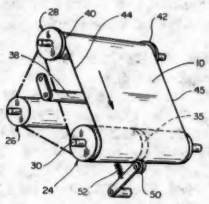
WIDE BELT TRACKING METHOD AND APPARATUS

Carl P. Anderson, Menlo Park, Calif., assignor to Ricoh Systems, Inc., San Jose, Calif. and Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 586,028, Mar. 5, 1984, abandoned. This application Jul. 2, 1985, Ser. No. 753,045

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—3 BE 13 Claims



1. A belt assembly for supporting an endless belt having an electrophotographic region movable through a plurality of electrophotographic processing stations arranged around the assembly including

at least two rollers having parallel axes for carrying said belt,

one of said rollers having flanges for centrally positioning said belt,

drive means connected to a second one of said rollers for moving said belt,

said belt moving roller have a single narrow frictional surface at the center of said second roller functioning as a pulley for movably engaging said belt to decouple the remaining width of the belt from the drive roller surface, the ratio of the width of said narrow frictional surface to the width of said one roller with flanges defining a width to pulley spacing of 10:1.

4,627,703

APPARATUS FOR FORMING IMAGES FROM POSITIVE AND NEGATIVE ORIGINALS

Hiroaki Suzuki, Hachiohji; Shinji Murata, Tokyo; Masanari Shirai, Chigasaki, and Kazuhiko Onuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 669,064, Nov. 7, 1984, abandoned. This application Feb. 13, 1986, Ser. No. 829,550

Claims priority, application Japan, Nov. 17, 1983, 58-216794; Nov. 17, 1983, 58-216795; Nov. 17, 1983, 58-216796

Int. Cl.[4] G03G *15/00*

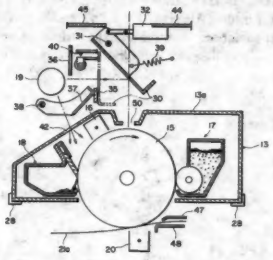
U.S. Cl. 355—3 R 21 Claims

1. A cartridge detachably mountable into an image forming apparatus, comprising:

a photosensitive member;

a casing for supporting said photosensitive member; and

means, operable when mounted in the main assembly, for actuating means for preventing a non-image area of said



photosensitive member from being exposed to light, upon formation of a positive image from a negative original.

4,627,704

LIGHT AMOUNT LIMITING DEVICE OF ELECTROPHOTOGRAPHIC COPYING MACHINE

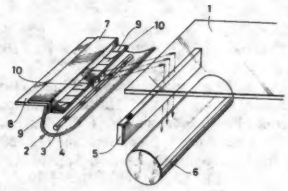
Hideaki Hamasaki; Shigeharu Maehara, both of Nara, and Shinsuke Saita, Habikino, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 31, 1983, Ser. No. 547,400

Claims priority, application Japan, Nov. 4, 1982, 57-167691[U]

Int. Cl.[4] G03G *15/04;* G03B *27/72*

U.S. Cl. 355—3 R 2 Claims



1. An electrophotographic copying machine comprising:

means for supporting a document to be copied;

a photoconductive image member;

an elongated light source for projecting light onto a surface of said document for reflection onto the photoconductive image member;

a bowl-shaped reflector extending the length of said elongated light source for projecting light onto said document; and

a light limiting assembly positioned between said elongated light source and said document, said light limiting assembly including a plurality of discrete, separately adjustable light limiting blades disposed along the length of the elongated light source and supported on a portion of said bowl-shaped reflector;

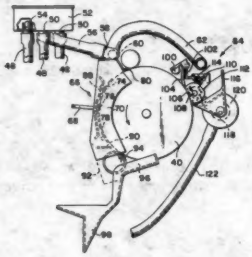
whereby the amount of light incident on said document may be selectively varied along the length of said elongated light source by bending each of said separately adjustable light limiting blades to fixed positions with respect to the elongated light source.

4,627,705

MULTIPLE COLOR LIQUID DEVELOPER ELECTROPHOTOGRAPHIC COPYING MACHINE AND LIQUID DISTRIBUTION SYSTEM THEREFOR

Benzion Landa, Alberta, Canada, and Josef Rosen, Rehovot, Israel, assignors to Savin Corporation, Stamford, Conn.

Filed Jul. 6, 1984, Ser. No. 628,462
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—4 10 Claims



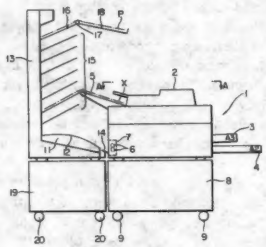
1. A copying machine including in combination means for providing a surface for receiving an electrostatic latent image, a developer applicator for applying liquid developer to said image, a plurality of supplies of liquid developer of different colors, first common conduit means for feeding liquid to said applicator, first feeding means for selectively feeding liquid from one of said supplies to said first common conduit means, second common conduit means for collecting from said surface liquid fed to said applicator by said first common conduit means, second feeding means for selectively feeding liquid from said second conduit means to the supply from whence it came, a supply of cleaning liquid, and third feeding means for feeding cleaning liquid from said cleaning liquid supply to said first common conduit means.

4,627,706

SORTING MACHINE AND IMAGE REPRODUCING APPARATUS

Seiji Takahashi; Masayuki Miyazaki; Tsugio Hirabayashi, and Yoshikazu Maekawa, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,358
Claims priority, application Japan, Apr. 12, 1984, 59-74420
Int. Cl.[4] G03G *15/00;* B65H *39/10*
U.S. Cl. 355—14 SH 28 Claims



1. A sorting machine for collating sheets ejected from an image-reproducing apparatus comprising

a plurality of sorting bins comprising at least one large bin and at least one small bin;

a conveying means for transporting the sheets to the bins;

a guide means for selectively leading the sheets being transported by the conveying means into the bins;

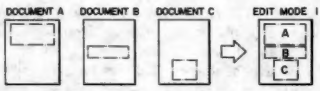
a control means for controlling the guide means to lead a large sheet which is incapable of being received in the small bin to the large bin in response to a signal generated by a means mounted in the image-reproducing machine for detecting a selection of the large sheet.

4,627,707

COPIER WITH IMAGE EDITING FUNCTION

Tatsuo Tani, Urayasu; Akira Midorikawa, Yokohama; Masaji Ito, Ageo; Masashi Kuno, Tokyo; Masayuki Shinada, Yokohama; Hirobumi Yoshino, and Yoshihiro Nakashima, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 17, 1985, Ser. No. 745,121
Claims priority, application Japan, Jun. 16, 1984, 59-122911; Jun. 16, 1984, 59-122912; Jun. 16, 1984, 59-122913; Jun. 16, 1984, 59-122914; Jun. 16, 1984, 59-122915; Jun. 16, 1984, 59-122916; Jun. 16, 1984, 59-122917; Jun. 16, 1984, 59-122918; Jun. 16, 1984, 59-122919; Jun. 16, 1984, 59-122920; Jun. 16, 1984, 59-122921; Jun. 16, 1984, 59-122922; Jun. 16, 1984, 59-122923; Jun. 16, 1984, 59-122924; Jun. 16, 1984, 59-122925
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R 15 Claims



1. A copier having an image editing function, comprising:

a photoconductive element and a charger for depositing a uniform electrostatic charge on said photoconductive element;

an illuminating and exposing optical device for projecting an optical image of a document onto the photoconductive element;

a developing device for developing an image provided on a surface of the photoconductive element;

an erasing device for selectively erasing the image provided on the surface of the photoconductive element;

a sheet feeding device for feeding a transfer sheet;

a detaining device for temporarily detaining the transfer sheet to which the image developed by the developing device has been transferred;

a discharging device for discharging the transfer sheet to which the image developed by the developing device has been transferred;

a discharge path extending from a predetermined transfer station to said discharging device;

a communication path for providing communication between said transfer position and the detaining device;

a selector for selecting one of said discharge path and said communication path;

an image inputting device for inputting an image carried on a document;

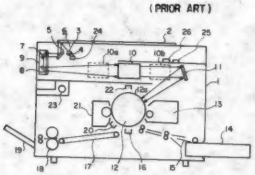
a display device for displaying an input condition; and

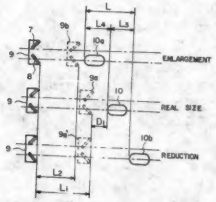
a control device for causing a copying operation to be started after specifying a desired area of a first document and, during said copying operation, specifying a desired area of a second document and, thereby, repeatedly specifying desired areas of a plurality of documents.

4,627,708
PHOTOCOPYING APPARATUS

Kouichi Arai, and Yukio Akita, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd. and Casio Electronics Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 631,057
Claims priority, application Japan, Jul. 18, 1983, 58-130575
Int. Cl.[4] G03G *15/04*; G03B *27/34*
U.S. Cl. 355—14 R **8 Claims**





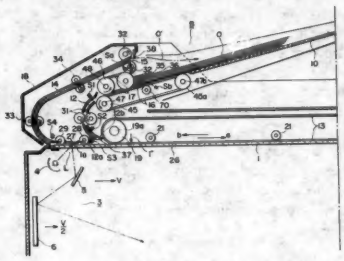
1. A photocopying apparatus comprising an optical device which can be moved in a reciprocal manner, for having an original exposed and scanned, means for enabling the optical device to perform a reciprocal movement, a lens for projecting an image of the original from the optical device onto a photosensitive member, lens position detecting means for detecting a position of the lens, means for designating a magnification ratio of a photocopying, means for moving said lens through an electric circuit in accordance with said designating means, and a position detecting switch for determining whether said optical device is positioned at a predetermined position outside the area where said lens moves, and operational means for operating said means for moving the lens after the optical device is moved into said predetermined position when said position detecting switch detects that said optical device is not positioned at said predetermined position and said lens position detecting means detects that the lens is not at a position for enlargement copying.

4,627,709
AUTOMATIC SHEET FEEDER AND AN IMAGE RECORDING APPARATUS PROVIDED THEREWITH

Tadayuki Kitajima, Yokohama; Makoto Kitahara, Tokyo, and Koichi Murakami, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 669,245
Claims priority, application Japan, Nov. 8, 1983, 58-209692; Nov. 10, 1983, 58-211423
Int. Cl.[4] G03G *15/00*; B65H *5/22*
U.S. Cl. 355—14 SH **7 Claims**

1. An automatic sheet feeding apparatus, comprising:
stacking means for stacking sheets thereon;
feeding means for feeding one by one the sheets stacked from said stacking means;
conveying means for conveying the sheets fed out of the sheet stacking means by said feeding means and reversing the face orientation of the sheets;
switch-back means for receiving sheets in a direction and stopping the sheets conveyed by said conveying means and sending the sheets back in an opposite direction;
returning means for returning to said sheet stacking means the sheets sent back by said switch-back means;
a first exposure station for scanning the sheets while they are

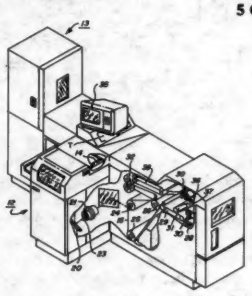


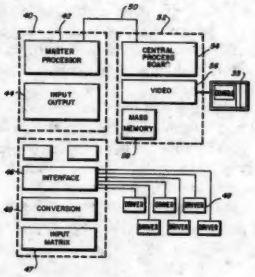
moving, after the sheets are reversed in the face orientation but before the sheets are returned to the sheet stacking means by the returning means; and
a second exposure station for scanning the sheets while they are stationary by being stopped by said switch-back means.

4,627,710
CUSTOMIZED JOB DEFAULT SET-UP

Frank M. Goetz, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 4, 1985, Ser. No. 707,778
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—14 R **5 Claims**





1. In a printing machine for producing impressions of an original, the printing machine having a photosensitive member,

a plurality of discrete operating components cooperable with one another and the photosensitive member to electrostatically produce the impressions upon support material, and a controller having an operating console and a display, the console providing a plurality of switches to select job parameters, the machine upon cycle out at the end of a job requirement reverting to a given set of job parameters, said given set of job parameters being the dominant machines mode, the method of changing said dominant machine mode including the steps of:

initially setting up, said given set of job parameters to be returned to upon machine cycle out,

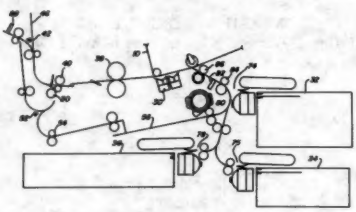
displaying on the display said given set of machine parameters, and

selectively changing at least one of the displayed parameters whereby upon machine cycle out the machine will revert to a second given set of job parameters, said second given set of job parameters being a new dominant machine mode.

4,627,711
MACHINE SHUTDOWN CONTROL

Steven M. Schron, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1985, Ser. No. 781,569
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 SH **13 Claims**



1. In a printing machine having a plurality of operating components including a copy sheet path cooperating with one another to produce images on copy sheets, the copy sheet path being divided into a plurality of zones for movement of the copy sheets, each of the zones including an associated copy sheet drive, and a control including a processor and memory, the memory having a plurality of sections, each section maintaining status information relating to the location and travel of the copy sheets in the copy sheet path, including the source and destination of each of the copy sheets within the copy sheet path, the control monitoring the conveyance of copy sheets along the copy sheet path for the occurrence of malfunctions to determine either a cycle down or an immediate shutdown, the method of controlling of the shutdown of the machine upon the detection of a copy sheet malfunction comprising the steps of

tracking both the lead edge and the trail edge of each copy sheet and dynamically updating this information in memory for each sheet in the copy sheet path,

recognizing the location of the malfunction,

determining that a specific copy sheet is the source of the machine malfunction and identifying that either the lead edge or the trail edge of said copy sheet is the source of the malfunction,

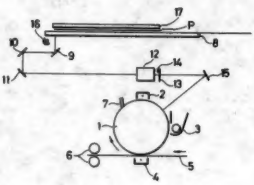
identifying the zone of location of each of the copy sheets within the copy sheet path, and

deciding either a cycle down or an immediate shutdown and responding in accordance with either a cycle down or immediate shutdown.

4,627,712
IMAGE DENSITY CONTROL APPARATUS

Akihiro Usami, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,493
Claims priority, application Japan, Aug. 6, 1983, 58-144121; Aug. 6, 1983, 58-144122
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R **9 Claims**



1. An image density control apparatus for controlling image processing procedures, comprising:

detection means for detecting a density of an image prior to image processing;

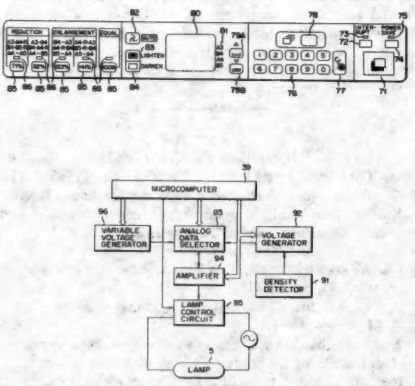
memory means for storing therein data representing the density detected by said detection means, said data being stored in relationship to a plurality of positions on an original; and

control means for adjusting a condition for image processing corresponding to each of said plurality of positions on the original, in response to said data stored in relation to each said position on the original.

4,627,713
COPYING MACHINE

Yasuo Abuyama, Ebina, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 13, 1984, Ser. No. 681,571
Claims priority, application Japan, Dec. 20, 1983, 58-238809
Int. Cl.[4] G03G *15/04*
U.S. Cl. 355—14 R **3 Claims**



1. A copying machine comprising:

reading means for optically scanning a document and reading image data of the document;

copying means for forming a copy of the document in accor-

dance with the image data read by said reading means and a density signal;

manual density adjusting means, having first and second operation members, for setting a manual adjusting mode and generating a plurality of limited and discrete density signals, wherein a density of the density signal is increased in accordance with an operation of said first operation member and is decreased in accordance with an operation of said second operation member;

automatic density adjusting means, connected to said reading means and having a third operation member for setting an automatic adjusting mode, for detecting a density of the document so as to generate a density signal in accordance with the detected density; and

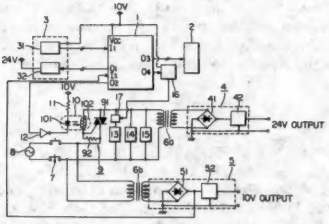
selecting means, connected to said manual density adjusting means and automatic density adjusting means for supplying an output to said copying means from said manual density adjusting means in the manual adjusting mode and from said automatic density adjusting means in the automatic adjusting mode.

4,627,714

RECORDING APPARATUS WITH CONTROLLED POWER SOURCE FOR HEAT FUSING DEVICE

Hiromi Nozaki, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,183
Claims priority, application Japan, Jun. 8, 1982, 99027
Int. Cl.[4] G03G *13/20, 15/20*
U.S. Cl. 355—14 FU **21 Claims**



9. In a recording apparatus having a heat fusing device, a power source for supplying power to said heat fusing device, and means for cutting off the supply of power to said heat fusing device after the lapse of a given period of time after completion of a recording operation,

the improvement comprising control means coupled to said heat fusing device and to said power source for controlling the supply of power to said heat fusing device, said control means comprising:

means for supplying power from said power source to said heat fusing device to produce a predetermined heat temperature at said heat fusing device during a recording operation;

means for supplying power from said power source to said heat fusing device during a first given period of time beginning after the completion of a recording operation to maintain said heat fusing device at a given temperature sufficient for recording;

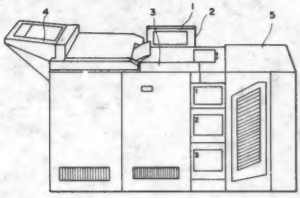
means for gradually reducing the power supplied from said power source to said heat fusing device during a second given period of time beginning after the end of said first period of time in accordance with a given time function over said second given period of time; and means for cutting-off completely the supply of power from said power source to said heat fusing device at the end of said second given period of time.

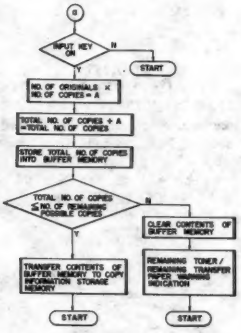
4,627,715

PROGRAMMABLE COPIER

Mitsutoyo Kikuno, Machida, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Aug. 29, 1984, Ser. No. 645,916
Claims priority, application Japan, Aug. 31, 1983, 58-157904; Sep. 21, 1983, 58-173245
Int. Cl.[4] G03G *21/00, 15/00*
U.S. Cl. 355—14 R **4 Claims**




INPUT KEY ON
START
NO. OF ORIGINALS × NO. OF COPIES = A
TOTAL NO. OF COPIES + A = TOTAL NO. OF COPIES
STORE TOTAL NO. OF COPIES INTO BUFFER MEMORY
TOTAL NO. OF COPIES ≤ NO. OF REMAINING POSSIBLE COPIES
CLEAR CONTENTS OF BUFFER MEMORY
TRANSFER CONTENTS OF BUFFER MEMORY TO COPY INFORMATION STORAGE MEMORY
REMAINING TONER / REMAINING TRANSFER PAPER WARNING INDICATION
START
START

1. Apparatus for making copies automatically in accordance with temporarily stored copy information, comprising:

input means for inputting said copy information for each copy job, said copy information including at least a number of originals from which one or more copies are to be made and a number of copies to be made from each of said originals;

storing means for storing said copy information job by job;

detecting means for detecting current conditions of said apparatus;

control means for controlling storing of said copy information for each job input by said input means into said storing means such that said copy information for each job is allowed to be stored into said storing means as long as a cumulative total number of copies to be made does not exceed a maximum number of copies obtained from the current conditions detected by said detecting means; and

means for making copies in accordance with the copy information stored in said storing means.

4,627,716

TONER HANDLING APPARATUS FOR ELECTRO-PHOTOGRAPHIC COPYING MACHINES

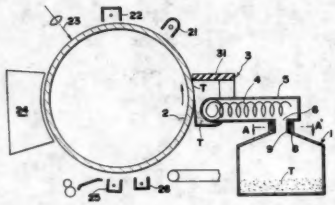
Tateki Oka, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1984, Ser. No. 638,716

Claims priority, application Japan, Aug. 12, 1983, 58-125940[U]; Aug. 12, 1983, 58-125941[U]

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—15 19 Claims



1. A toner handling apparatus for use in a transfer-type electrophotographic copying machine comprising an opening in said toner handling apparatus, a thermally expandable resin provided in said opening and heating means for expanding said resin.

4,627,717

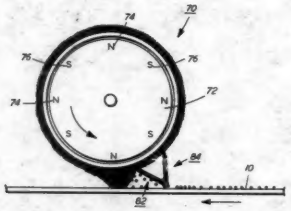
CLEANING APPARATUS FOR A XEROGRAPHIC REPRODUCING APPARATUS

Michael D. Thompson, Rochester, and Clifford W. Imes, IV, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 14, 1985, Ser. No. 701,890

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—15 6 Claims



3. Apparatus for forming toner images on a charge retentive surface and removing residual toner from the surface, said apparatus comprising:

a magnetic brush having bristles and being supported adjacent said charge retentive surface such that said bristles contact said charge retentive surface;

a residual toner disturber supported adjacent said charge retentive surface upstream of said magnetic brush and adapted to condition said residual toner for removal by said magnetic brush;

said bristles comprising magnetic particles; and

said disturber comprising a magnetic structure supported adjacent said magnetic brush whereby a magnetic field is passed therethrough upon rotation of said magnetic brush and said bristles are caused to contact residual toner on said charge retentive surface.

4,627,718

SHEET CURL CONTROL APPARATUS FOR A COPIER

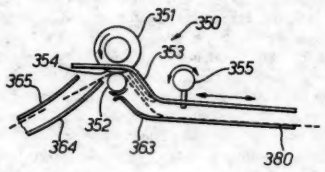
Andrew F. Wyer, Comberton, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1984, Ser. No. 616,336

Claims priority, application United Kingdom, Jun. 8, 1983, 8315732

Int. Cl.[4] G03G *21/00;* D21H *5/24*

U.S. Cl. 355—35 H 8 Claims



8. A copier for duplex copying, including a photoreceptor, a copy sheet tray, a duplex buffer tray, sheet feeders associated with said trays for feeding sheets from said trays to the photoreceptor, a fuser for fixing images received on sheets at the photoreceptor, a sheet return path of conveying simplex sheets which have received an image on one side at the photoreceptor to receive a second image on the other side, and a sheet curl control apparatus in said sheet return path comprising a pair of coating rolls and a baffle means extending from a position upstream of said rolls to a position downstream of said rolls and having a portion thereof extending downward at an acute angle from immediately before a nip formed between said rolls to immediately after the nip in relation to a tangential line through the nip so as to bend a sheet passing between the rolls about one of said rolls.

4,627,719

METHOD AND APPARATUS FOR REPRODUCING THE IMAGES OF FILM FRAMES

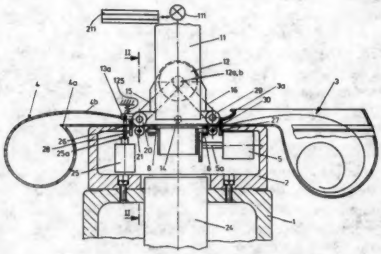
Wilhelm Nitsch; Helmut Treiber, both of Munich, and Gerhard Benker, Pullach, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 20, 1985, Ser. No. 778,613

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 3437222

Int. Cl.[4] G03B *27/52, 27/32*

U.S. Cl. 355—41 31 Claims



1. A method of copying successive image carrying sections of a series of such sections on a length of photographic material, comprising the steps of advancing the length of photographic material longitudinally in a first direction; individually photoelectrically monitoring predetermined parameters of successive sections of said series in the course of said advanc-

ing step and generating and storing signals denoting characteristic values which are representative of said predetermined parameters; thereupon transporting the length of photographic material longitudinally in a second direction counter to said first direction; and reproducing the images of said sections in the course of said transporting step starting with the last monitored section and proceeding toward the first monitored section, including exposing the sections to copying light and influencing the copying light as a function of the respective stored signals.

4,627,720

VARIABLE MAGNIFICATION IMAGE PROJECTOR

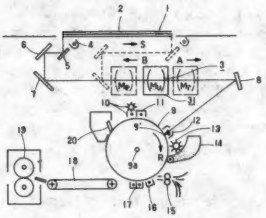
Takaji Yonemori, Tokyo, and Hideki Adachi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 717,470, Mar. 28, 1985, which is a continuation of Ser. No. 565,368, Dec. 27, 1983, abandoned. This application Sep. 18, 1985, Ser. No. 778,166

Claims priority, application Japan, Jan. 6, 1983, 58-181

Int. Cl.[4] G03B *27/34, 27/40, 27/70*

U.S. Cl. 355—57 **32 Claims**



1. A variable magnification image projecting apparatus for projecting the image of an original onto a photosensitive member with a selected magnification, said apparatus comprising:

a zoom lens for forming an image of the original on the photosensitive member;

lens drive means for moving said zoom lens along a predetermined path;

focal-length changing means for changing the focal length of said zoom lens in association with the operation of said lens drive means; and

control means for controlling said lens drive means such that in response to a selected magnification, said zoom lens is shifted to a goal position spaced away from an initial position of said zoom lens by a distance D and such that the focal length of said zoom lens is changed to a value corresponding to the selected magnification,

said control means controlling said lens drive means such that said zoom lens is moved through the distance D in the first direction when said goal position corresponding to the selected magnification is far in a first direction as viewed from said initial position and such that when said goal position corresponding to the selected magnification is far in a second direction opposite to the first direction as viewed from said initial position, said zoom lens is moved to a reversal position spaced away from said initial position by a distance (D+ΔD) in the second direction and then moved back by a distance ΔD is the first direction.

4,627,721

AUTOMATIC SCANNING OPTICS ALIGNMENT

Tuan A. Nguyen; Ronald T. Sosinski, both of Rochester, and Wayne A. Buchar, Holcomb, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 20, 1985, Ser. No. 800,176

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—77 **6 Claims**

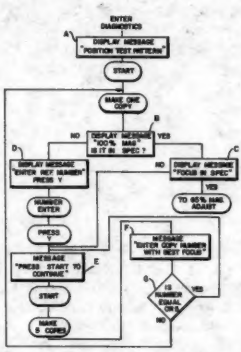
1. In an electrophotographic printing machine having a scan illumination optical system for illuminating a document to be copied on a platen surface and for projecting an image of the document along an optical path onto a photoreceptor to form a latent image, the scan illumination system including a lens and a plurality of mirrors, the printing machine including a controller having a memory, the method of aligning the optical system comprising the steps of:

entering the diagnostic mode,

positioning a test pattern on the platen and making one copy thereof,

visually inspecting the test pattern and the copy for variations,

entering a number at the control panel indicating the degree of variation,



calculating a reference number for storage and memory indicating the relative positions of the lens and mirrors,

making additional copies of the test pattern in response to the new relative position of the optical components,

visually comparing the additional copies with the test pattern to select the best copy for focus,

entering the best copy number at the control console and calculating a new relative position of the optical components for focus, and

storing the new number representing the new relative position in memory.

4,627,722

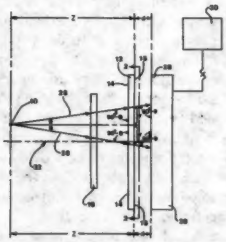
METHOD AND APPARATUS FOR OPTICALLY MEASURING THREE-DIMENSIONAL COORDINATES

Robert A. Falk, Kent, Wash., and Gary L. Phillis, Boulder, Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Aug. 31, 1984, Ser. No. 646,638

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—4.5 **14 Claims**



1. An apparatus for simultaneously measuring one to three of

the three-dimensional coordinates of one or more distant points, comprising:

a means for providing a point optical radiation source at each said distant point;

a multiple-beam interferometer means which receives optical radiation emitted from each said point optical radiation source, and which creates at least one interference fringe with respect to each said point optical radiation source due to the optical radiation received therefrom;

a photo-electric detection means which detects at least a portion of said one interference fringe created with respect to each said point optical radiation source, and which transmits electric signals in response to each of the detected interference fringes; and

processor means which receives said electric signals, and which employs the electric signals to determine one to three of the three-dimensional coordinates of each said distant point.

4,627,723

OPTICAL RANGE SIMULATOR DEVICES

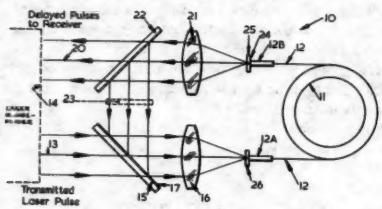
Timothy O. French, Kings Park; Derek R. Carless, Ralston; Reginald A. Ault, Bearsden, and Michael B. Darlow, Glasgow, all of Scotland, assignors to Barr & Stroud, Glasgow, Scotland

Filed May 9, 1984, Ser. No. 608,411

Claims priority, application United Kingdom, May 19, 1983, 8313875; Feb. 14, 1984, 8403899

Int. Cl.[4] G01C *3/08, 25/00*

U.S. Cl. 356—5 **9 Claims**



1. An optical range simulator device for testing the ranging function of a laser rangefinder, comprising first means defining a first optical axis for receiving output light pulses from the rangefinder to be tested, second means defining a second optical axis parallel to said first optical axis for delivering return light pulses to the rangefinder, an optical fibre delay line having a fibre input end and a fibre output end, the input end being coupled to receive light pulses from said first optical axis and the output end being coupled to deliver light pulses to said second optical axis, and optical bridging means comprising a pair of orthogonal beamsplitters one beamsplitter being disposed across said second optical axis and the other being disposed across said first optical axis, said optical bridging means being arranged to collect at least a portion of each light pulse delivered at the output end of said delay line and to deliver each said collected light pulse portion to the fibre input end of said delay line, whereby for each output light pulse received from the rangefinder along said first optical axis a series of successively delayed return light pulses are delivered at the output end of the delay line at ranges successively augmented by that range distance represented by the optical fibre delay line.

4,627,724

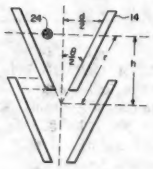
RADIATION SCANNING AND DETECTION SYSTEM

Scott H. Cameron, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 8, 1983, Ser. No. 511,811

Int. Cl.[4] G01B *11/26;* **G01C** *1/00*

U.S. Cl. 356—141 **8 Claims**



1. A radiation scanning and detection system comprising:

a plurality of optical radiation detectors positioned to detect radiation in azimuth and elevation from a remote source, each detector being adapted to provide a signal representative of said radiation, said detectors including a plurality of pairs of infrared sensitive elements aligned and spaced vertically in a common plane, respective said pairs having a V-shape including symmetrical elements spaced from each other about a vertical axis;

optical scanning means for scanning a field of view and directing radiation from said remote source transversely across said plurality of pairs of vertically aligned detectors, each said pair being adapted to cover a small angle of elevation in the field of view in accordance with the vertical position in said plane;

threshold means associated with each separate detector element for sensing each said signal at respective vertical positions and providing a digital pulse when each said signal exceeds a predetermined amplitude;

digital filter means for establishing a predetermined sequence of digital pulses representative of said signal and supplying an output pulse upon the occurrence of said sequence; and

signal processing means for processing a plurality of output pulses from a plurality of said digital filter means to locate the position of said remote source in said field of view.

4,627,725

OPTICAL AXIS MONITORING SYSTEM

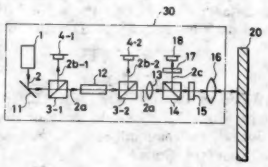
Takashi Nishio, Saitama, and Tomoyoshi Ikeya, Yamanashi, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,458

Claims priority, application Japan, Apr. 18, 1983, 58-57795[U]

Int. Cl.[4] G01B *11/26;* **G11B** *5/09*

U.S. Cl. 356—152 **3 Claims**



1. In an optical information recording apparatus for optically recording information on a recording surface of a record member comprising:

a laser beam source providing a laser beam directed onto said surface,

an electro-optical modulator positioned between said source and said surface and intercepting said beam to modulate said beam,

the improvement comprising:

a first beam splitter positioned in the path of said light beam downstream of said source and upstream of said modulator separating said beam into a main beam and a first sub-beam,

a first monitoring light detector element positioned in the path of said sub-beam,

a second beam splitter positioned in the path of said main beam downstream of said modulator further separating said main beam and forming a second sub-beam,

a second monitoring light detecting element positioned in the path of said second sub-beam,

a polarizing beam splitter positioned in the path of said main beam downstream of said second beam splitter and including a quarter-waveplate for rotating the main beam incident on said recording surface,

a lens interposed between said polarizing beam splitter quarter-waveplate and said recording surface for reflecting light from said recording surface to said polarizing beam splitter through said quarter-waveplate, such that the reflected light is rotated by the beam splitter through a given angle,

and wherein said polarizing beam splitter separates said reflected polarized light beam into a main reflected polarized light beam, and a polarized reflected light sub-beam, and

a polarized light sub-beam light detecting element positioned in the path of said polarized reflected light sub-beam;

whereby, an output signal is developed by the polarized light sub-beam detector element for controlling the position of the objective lens in a direction perpendicular to the recording surface so that the main recording light beam is prevented from being defocused by warpage of the recording surface under focus-servo operation, recording beam convergence is maintained on the recording surface at all time, and the optical axis of the main beam is maintained coincident with the designated optical axis by comparing the output signals of the two monitoring light detecting elements and permitting optical axis alignment with the designated optical adjustment solely by adjusting the laser beam source and without further adjustment of the balance of the components of the optical information recording apparatus.

4,627,726

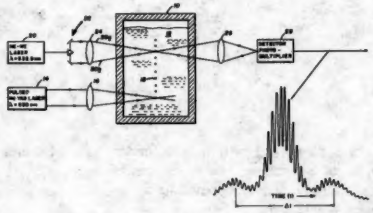
METHOD AND APPARATUS USING LASER RADIATION FOR GENERATING AND MEASURING GAS BUBBLES

Robert Turner, Silver Springs, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Jun. 17, 1985, Ser. No. 745,119

Int. Cl.[4] G01N *15/02*

U.S. Cl. 356—336 **7 Claims**



1. A non-intrusive system for measuring the quality of a liquid disposed within a container transparent to laser radiation comprising, in combination,

a first laser means external to said container producing a laser beam focused at a predetermined location within said liquid,

said focused laser beam heating said liquid locally to generate bubbles from gas dissolved within said liquid,

said bubbles migrating upwardly from said predetermined location at a velocity which varies in proportion to bubble size, and

a laser Doppler velocimeter including second laser means external to said container producing a pair of intersecting laser beams traversed by said migrating bubbles and a detector photomultiplier means generating an output electrical signal indicative of the velocity and the diameter of said bubbles as a measure of liquid quality.

4,627,727

MONITORING DEFLOCCULATED PARTICLES IN A SUSPENSION

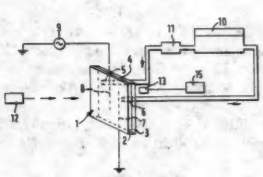
Barry R. Jennings, Chertsey, United Kingdom; Harold H. Trimm, Binghamton, N.Y., and Terence W. Webb, St. Austell, United Kingdom, assignors to English Clays Lovering Pochin & Company, Ltd., St. Austell, England

Filed Apr. 27, 1984, Ser. No. 604,849

Claims priority, application United Kingdom, Apr. 29, 1983, 8311800

Int. Cl.[4] G01N *21/00, 21/47, 21/51*

U.S. Cl. 356—338 **16 Claims**



1. A method of monitoring the deflocculation of particles in a liquid suspension, which particles, when deflocculated, are such that they can become aligned in an applied disturbance field, the method comprising:

(a) supplying the liquid suspension to a monitoring region;

(b) applying a beam of radiation to the suspension in said region;

(c) applying a disturbance field to said region, said field being in a direction parallel to the direction of said beam of radiation; and

(d) detecting a change, if any, in the forward radiation scattering properties of the suspension with respect to the beam in said region due to the aligning of any deflocculated particles of said suspension in said field.

4,627,728

COMPENSATED FABRY PEROT SENSOR

Jolyon P. Willson, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 27, 1984, Ser. No. 584,204

Claims priority, application United Kingdom, Mar. 16, 1983, 8307241

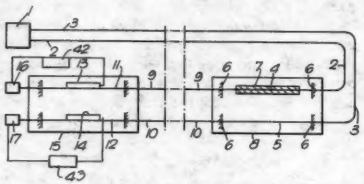
Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—345 **7 Claims**

1. A sensor system responsive to an independent sensed parameter to be evaluated, said system including first and second waveguide Fabry Perot cavities, said first cavity being the sensor cavity, said first and second cavities having similar optical path lengths and being optically in series, a first feedback control loop for monitoring the transmission of the series combination of said first and second cavities and being opera-

tively coupled to one of said first and second cavities to maintain a predetermined phase relationship between said optical path lengths of said first and second Fabry Perot cavities by controlling the path length of said first cavity while the optical path length of said first cavity is modulated by said sensed parameter, comprising:

a reference waveguide Fabry Perot cavity thermally strapped to one of said first and second cavities and being



of equivalent construction and optical path length vis-a-vis the associated one of said first and second cavities; and

a second feedback control loop for monitoring, at least in part, the transmission of said reference cavity and being operatively coupled to one of said second and reference cavities for maintaining a predetermined phase relationship between said reference cavity and one of said first and second cavities, by controlling the optical path length of one of said reference cavities or said second cavity.

4,627,729

DIFFERENTIAL HOLOGRAPHIC METHOD

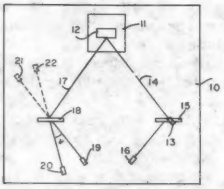
Bernd Breuckmann, Neubiberg, and Werner Thieme, Munich, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Postfach, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,082

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1983, 3303876

Int. Cl.[4] G01B *9/025*

U.S. Cl. 356—347 **2 Claims**



1. An improvement in a differential holographic method for measuring and verifying the changing condition of objects by holographic exposure in a method in which a first intermediate hologram of a reference object in an unchanged state is recorded, a second intermediate hologram of the reference object in a changed state is recorded, a test object, having a surface contour similar to that of the reference object, in an unchanged state is illuminated with the reconstructed object wave field from the first intermediate hologram, and the test object in a changed state is illuminated with the reconstructed object wave field from the second intermediate hologram, the improvement comprising: producing the first and second intermediate holograms of the reference object positioned in a holder while using successive reference beams incident on a single holographic plate, removing the reference object from the holder and replacing it with the test object, and successively illuminating the test object with the reconstructed object wave field from the first and second intermediate holograms on the single holographic plate by employing associated conjugated first and second reference beams on the single holographic plate, and recording the holograms resulting from the interference between the light reflected by the successive illumination of the test object with a third reference beam on a second holographic plate for subsequent interpretation.

4,627,730

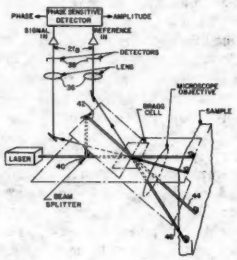
OPTICAL SCANNING MICROSCOPE

Roger L. Jungerman, Palo Alto, and Gordon S. Kino, Stanford, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jul. 6, 1984, Ser. No. 628,181

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—349 **18 Claims**



1. An optical scanning microscope comprising means for focusing at least two optical beams on a sample under study,

means for optically scanning one of said beams across the surface of the sample independent of movement of the sample itself, the other of said optical beams being held stationary relative to a fixed point on the surface of the sample whereby the distance between the landing points of said beams over the surface of the sample is variable,

means for comparing the phase of the reflected beams to determine the phase shift of the scanned beam relative to the phase of the stationary beam as representing surface variation anywhere on the surface of the object covered by said scanned beam.

4,627,731

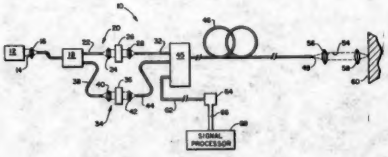
COMMON OPTICAL PATH INTERFEROMETRIC GAUGE

James P. Waters, Ellington, and Mark R. Fernald, Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 3, 1985, Ser. No. 772,106

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—349 **6 Claims**



1. A common optical path interferometric gauge for measuring motion of a workpiece surface, comprising:

optical source means for providing an optical beam having a coherence length;

optical apparatus for splitting said optical beam into first and second beams and providing modulation thereto, said first and second beams guided along first and second optical

paths respectively, having an optical path length difference selected to be greater than said coherence length;

common optical path means responsive to said first and second beams for forming a combined beam therefrom, guiding said combined beam therein, and splitting said combined beam into reference and measurement beams, guided respectively along a reference optical path and a measurement optical path including the workpiece surface, said measurement and reference optical paths having an optical path length difference selected to be approximately equal to the optical path length difference between said first and said second optical paths such that coherence is restored therebetween, said common path means combining said reference and measurement beams forming an interference beam;

detector means for receiving said interference beam and providing an electrical signal equivalent thereof; and

signal processing means for receiving and demodulating said electrical signal to determine a component thereof indicative of the motion of the workpiece surface.

4,627,732

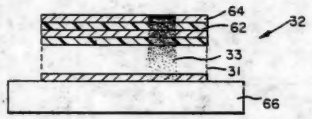
MODE DISCRIMINATION APPARATUS

Kenneth H. Braun, North Billerica, and Michael S. Perlmutter, Sherborn, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 265,712, May 20, 1981, Pat. No. 4,519,708. This application Sep. 6, 1985, Ser. No. 714,402

Int. Cl.⁴ G01C *19/64*; H01S *3/05*

U.S. Cl. 356—350 **27 Claims**



1. In combination:

an optical system comprising means for producing a plurality of electromagnetic waves;

dielectric material means within an optical path of said optical system for altering the phase and amplitude characteristics of said electromagnetic waves; and

said dielectric material means comprising a dielectric material having one or more areas of said material treated with an electron beam for producing said phase and amplitude alterations to said waves.

4,627,733

FLATNESS MEASURING APPARATUS

Toshiaki Wada, Takatsuki, Japan, assignor to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Filed Dec. 14, 1982, Ser. No. 449,733

Claims priority, application Japan, Dec. 25, 1981, 56-215418; Feb. 24, 1982, 57-29620; Feb. 24, 1982, 57-29621; Feb. 24, 1982, 57-29622; Feb. 24, 1982, 57-29623

Int. Cl.⁴ G01B *9/02*

U.S. Cl. 356—359 **7 Claims**

1. A flatness measuring apparatus which obtains interference fringes related to a plane to be measured and a reference plane, thereby measuring the flatness of said plane to be measured based on said interference fringes, said apparatus comprising:

an optical system for producing said interference fringes with a light means;

a one-dimensional image sensor having a number of photoelectric conversion elements arranged in a row to detect said interference fringes;

said image sensor being disposed to longitudinally detect said interference fringes in the direction of the width thereof;

a data processing unit which computes said flatness based on an output of said image sensor;

a data input means for inputting numeric data to said data processing unit;

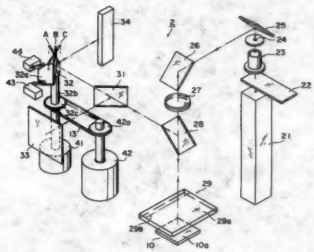
an optical means for turning the light from the interference fringes produced by said optical system toward said image sensor;

said optical means being pivotally supported to be turnable for changing the visual field of said image sensor in the extending direction of said interference fringes,

and,

a means for detecting the turning position of said optical means;

said data processing unit using information related to the detected turning position of said optical means as specific information related to the visual field of said image sensor



in computation of the flatness of said plane to be measured, and using said numeric data from said data input means as an information which specifies said visual field of said image sensor;

said data processing unit comparing the data which has been computed based on the outputs of said image sensor, said computed data corresponding to the positions of said interference fringes as detected by said image sensor, and said outputs being successively output and said data processing unit identifying two of said data outputs corresponding to the positions of two fringes as detected by said image sensor as actually being data corresponding to the same fringe when the dimensional difference in the positions of said two fringes, as detected by said image sensor, is equal to or less than a quarter of the wavelength of said light means used for generating the interference fringes.

4,627,734

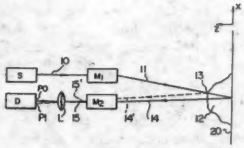
THREE DIMENSIONAL IMAGING METHOD AND DEVICE

Marc Rioux, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Continuation of Ser. No. 509,373, Jun. 30, 1983, abandoned. This application Jan. 16, 1986, Ser. No. 819,477

Int. Cl.⁴ G01C *3/00*; G01B *11/24*

U.S. Cl. 356—376 **22 Claims**



1. In a method of determining the profile of a surface relative

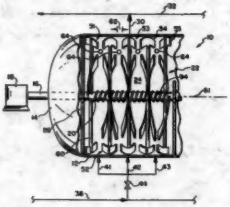
to a reference plane, comprising projecting a beam of radiation to strike an area of the surface and detecting a beam reflected by such surface area, portions of the projected and detected beams that intersect at said area defining a beam plane that intersects the reference plane along a direction X; the improvement comprising synchronously scanning said beam portions in the beam plane to move in the direction X the surface area at which said beam portions intersect, whereby each detected position of the detected beam in the direction X represents a deviation of a respective said area from the reference plane in a direction Z perpendicular to the reference plane.

4,627,735

DOUBLE REVERSE HELIX AGITATOR

Philip M. Rose, Naperville, and Yoon S. Song, Lisle, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 7, 1985, Ser. No. 699,335
Int. Cl.[4] B01F *7/00*
U.S. Cl. 366—329 **17 Claims**



1. For use in a gas phase olefin polymerization reactor having at least one polymerization section, a double reverse helix agitator comprising:

a shaft having a spiral screw thread,

a first helix flight and a second helix flight each having approximately a same radius from an axis of rotation of said shaft and mounted to said shaft,

said first helix flight and said second helix flight each having a same pitch of between 0.5:1 and 2:1 with said pitch of said first helix flight extending in an axial direction opposite to said pitch of said second helix flight.

4,627,736

THIN CARD-TYPE ELECTRONIC APPARATUS

Shigeki Komaki, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 503,541, Jun. 13, 1983, abandoned. This application Nov. 26, 1984, Ser. No. 675,251
Claims priority, application Japan, Jun. 15, 1982, 57-104373
Int. Cl.[4] G04C *23/02*; G06F *1/00*; H01H *13/70*; H05K *7/00*
U.S. Cl. 368—88 **13 Claims**

1. An electronic apparatus consisting essentially of:

a substrate having a first wiring pattern on a first surface thereof, said first wiring pattern including first key contacts and first electrically conductive paths connected to said first key contacts;

at least one recess in said first surface of said substrate for receiving an electronic component;

at least one electronic component positioned within said at least one recess, said electronic component having electrical conductor leads;

a flexible layer having a second wiring pattern on a first surface thereof, said second wiring pattern comprising second key contacts and second electrically conductive paths connected to said second key contacts;

said flexible layer being positioned on said substrate such that said first surface of said flexible layer faces said first surface of said substrate and said first key contacts are aligned with said second key contacts and said flexible layer covers said at least one recess;

spacer means interposed between said substrate and said flexible layer at least adjacent said first and second key contacts to space said key contacts from each other; and

power supply means;

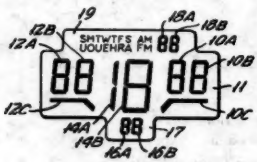
wherein said electrical conductor leads of said electronic component and said power supply means are each electrically engaged with at least one of said first and second electrically conductive paths of said first and second wiring patterns.

4,627,737

FULLY BI-DIRECTIONAL DIGITAL TIME DISPLAYS

Edwin P. Nance, Hong Kong, Hong Kong; Marc H. Segan, New York, and Berj A. Terzian, Briarcliff Manor, both of N.Y., assignors to Equitime, Inc., Briarcliff Manor, N.Y.

Filed May 16, 1985, Ser. No. 734,979
Int. Cl.[4] G04C *17/00*
U.S. Cl. 368—239 **15 Claims**



1. Fully bi-directional digital time displays which comprise:

(a) hour elements operable for display of current or next hour digits during the same hour;

(b) first minute elements operable for display of minute digits in a position to the right of a displayed current hour;

(c) second minute elements operable for display of minute digits in a position to the left of a displayed next hour;

(d) seconds elements operable to display either increasing or decreasing seconds;

(e) means for operating the first minute elements (b) to display increasing values of minutes from none to thirty while a current hour is on display and for operating the seconds elements (d) to display increasing values of seconds from zero to fifty nine during the period of each such minute except after thirty elapsed minutes;

(f) means for operating the second minute elements (c) to display decreasing values of minutes from twenty nine to none while a next hour is on display and for operating the seconds elements (d) to display decreasing values of seconds from fifty nine to zero during the period of each such minute except before twenty nine remaining minutes; and

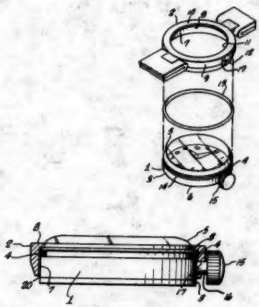
(g) means for displaying zero to about thirty seconds while the first minute elements (b) are displaying thirty minutes, then switching the display at the next second by blanking the first minute elements (b) and advancing the hour digit (a) to the next hour, and displaying about twenty nine to zero seconds while the second minute elements (c) are displaying twenty nine minutes.

4,627,738

WATCHCASE AND WATCHFRAME ASSEMBLY

Chung-fu Kao, 2440 S. Hacienda Blvd., No. 112, Hacienda Heights, Calif. 91745

Filed Jan. 28, 1985, Ser. No. 695,279
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—281 3 Claims



1. A watchcase and a watchframe suitable for mating and unmating one with the other comprising:

(a) A watchcase having a mating surface which surface has a recessed groove therein, a shoulder, a top surface and a back surface;

(b) A watchframe having a mating surface, an interior rim, a normal exterior surface, an exterior rim, a top opening, and a bottom opening;

(c) A mating means substantially fixed within said recessed groove of the mating surface of the watchcase which means is suitable for mating the watchcase with the watchframe by slidably translating the mating surface of the watchcase within the mating surface of the watchframe to provide a substantially contiguous fit between the mating surfaces of said watchcase and watchframe;

(d) Said watchcase and watchframe mating by maintaining the watchframe stationary relative to the watchcase, placing the top surface of the watchcase into the bottom opening of the watchframe, applying sufficient pressure to the back surface of the watchframe, slidably translating the watchcase into the watchframe, substantially abutting said watchcase shoulder with said interior rim of the watchframe, said mating means substantially abutting both the mating surface of the watchframe forming a substantially contiguous fit between both mating surfaces; AND

(e) Said watchcase and watchframe unmating by maintaining the watchframe stationary, applying sufficient pressure to the top surface of the watchcase, slidably translating the watchcase out of the watchframe.

4,627,739

BRACELET TYPE WRIST WATCH

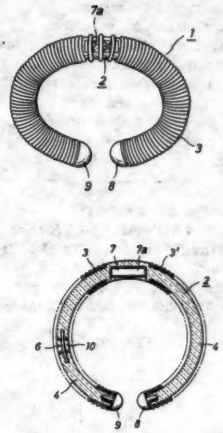
Ichikawa Shingo; Hisahide Nakagawa; Hayao Kano, and Koji Kudo, all of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1985, Ser. No. 697,077
Claims priority, application Japan, Feb. 3, 1984, 59-13987[U]; Feb. 3, 1984, 59-13988[U]; Feb. 3, 1984, 59-13989[U]
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—282 9 Claims

1. A bracelet type wrist watch comprising:

a curved body having a watch module embedded therein; and

a coil spring having an outer dimension which is greater than the outer dimension of said curved body enclosing at least part of said curved body including said watch module, the portion of said coil spring enclosing said watch module being movable to at least a first position wherein said portion of the coil spring is compressed to cover said watch module and a second position wherein said portion



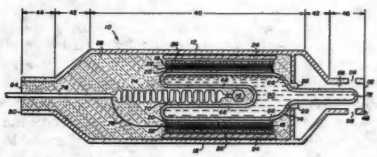
of the coil spring is expanded to permit viewing of said watch module.

4,627,740

SELF-CALIBRATING TEMPERATURE PROBE APPARATUS AND METHOD FOR USE THEREOF

James B. Jerde, Scotts Valley, and James E. Vasbinder, San Jose, both of Calif., assignors to Digital Dynamics, Inc., Scotts Valley, Calif.

Filed Apr. 6, 1984, Ser. No. 597,511
Int. Cl.[4] G01K *15/00*
U.S. Cl. 374—1 20 Claims



1. A self-calibrating thermostat apparatus comprising:

a housing;

a substance within the housing, the substance having a solid phase, a liquid phase and a melting point which melting point is at a temperature in excess of the ambient temperature surrounding the housing;

container means disposed within the housing the containing the substance in a leak proof manner;

the housing has two end portions joined by a central section, said central section being greater in area than said end portions, and at least one end portion has portions defining circulation apertures through which air from the envionment surrounding the housing may pass into said end portion having said circulation apertures, the container means is a vial having a neck section and a base section, said base section being of a greater area than said neck section, and a predetermined portion of said neck section is within said end portion of the housing having said circulation apertures so that said portion of said neck section is exposed to the ambient termperature;

a temperature sensor adjacent the container means and capa-

ble of generating electrical signal responsive to temperature variations;

temperature control means positioned about the container means for heating the substance;

a layer of encapsulating material about the heating means;

a layer of insulation means positioned intermediated the encapsulating material and the housing for isothermally insulating the container means from the environment outside of the housing; and

a sealant means positioned about the inside of the housing for sealing the container within the housing in a leak proof manner.

4,627,741

MAXIMUM-MINIMUM-THERMOMETER

Dagmar Faller, Otto-Schott-Strasse 19, D-6980 Wertheim, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,511

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332644

Int. Cl.[4] G01K *5/20*

U.S. Cl. 374—104 **11 Claims**

1. Maximum-minimum thermometer with a base plate having a top end and a lower end, temperature scales arranged on said base plate, with a U-shaped capillary tube having a top end and a lower end and having two legs connected at their lower ends by a bent section containing an extension medium, a mercury filament as well as magnetically attractable display pins and having on both legs of the capillary tube parallel permanent magnetic adhesive strips for the temporary fixing of the display pins showing the maximal-minimal temperatures which can be returned to their initial position by magnets moved on the outside of said capillary tube, wherein the adhesive strips (13, 14) are arranged and secured on the front or the back of said base plate (2) behind the two legs (6, 7) of the capillary tube (5) or laterally therefrom, and in that on said base plate (2) a slide element (9) is provided which is movable along the two legs (6, 7) of the capillary tube (5) and along the temperature scale (3, 4) and overlaps them, on which at least one permanent magnet (33) is arranged with a fource which exceeds the magnetic force of the adhesive strips (13, 14) by which magnetic force the two display pins (11, 12) can be simultaneously returned by a corresponding movement of said slide element (9) from their extreme positions to their initial positions at the ends of the mercury filament (10), and wherein said slide element forms a lower end cap for covering said bent section of said U-shaped capillary tube and is movable from the bottom of the lower end of the base plate to the extreme positions of the display pins for returning said display pins to their initial positions when the lower end cap is returned to the bottom of the lower end of the base plate.

4,627,742

COMPUTER CONTROLLED ELECTRONIC THERMOMETER

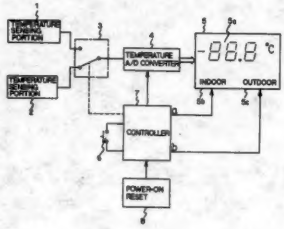
Tamaki Sakamoto, Kyoto, and Sakamoto Yoshihisa, Shiga, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 8, 1985, Ser. No. 709,750

Claims priority, application Japan, Mar. 8, 1984, 59-33888

Int. Cl.[4] G01K *1/02, 3/00*

U.S. Cl. 374—109 **3 Claims**



1. An electronic thermometer, comprising:

a first and a second temperature sensing means for detecting temperature at two different locations, each of which temperature sensing means produces an output corresponding to the respective detected temperature;

a display means for displaying a temperature or temperatures in a display mode selected from a first mode in which the temperature detected by said first temperature means is continuously displayed, a second mode in which the temperature detected by said second temperature sensing means is continuously displayed, and a third mode in which the temperatures detected by said first and second temperature sensing means are alternately displayed;

a computer-controlled control means for selectively setting the display mode of said display means, said computer-controlled control means including a command means for manually entering a command for selecting one of said display modes and a control unit responsive to the entered command for controlling the selective setting of the display mode;

a first selection means connected to said computer-controlled control means for selecting the desired display mode to be set by said computer-controlled control means; and

a second selection means connected to said computer-controlled control means and directly responsive thereto for selectively connected the respective desired outputs of said first and second temperature sensing means to said display means,

said second selection means inclusing a change-over means for selecting one of the respective outputs of said first and second temperature sensing means and including output signalling means for producing an output signal to which said display means is directly responsive to display the desired display mode.

4,627,743

MEASURING TEMPERATURE OF A HEATED METAL

Takahiro Okabe, Nagoya, and Masashi Mizuno, Chita, both of Japan, assignors to Educational Foundation Daido Gakuen and Daido Tokushuko Kabushiki Kaisha, both of Nagoya, Japan

Filed Jul. 19, 1984, Ser. No. 632,360

Claims priority, application Japan, Jul. 19, 1983, 58-131631

Int. Cl.[4] G01J *5/06, 5/10*

U.S. Cl. 374—122 **2 Claims**

1. A method for measuring the temperature of steel pieces in

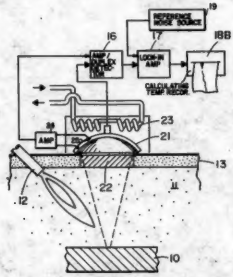
a heating furnace having an atmosphere containing a flame and suspended particles, comprising:

positioning a parabolic antenna facing a specific area of a surface of at least one of the steel pieces in the furnace,

providing said parabolic antenna with a heat insulating material on its front surface;

with said parabolic antenna receiving microwaves of a wavelength in the range of 1 to 10 cm emitted from said specific area of the surface of said at least one steel piece;

measuring the intensity of the received microwaves as the flame is selectively turned on and off;



compensating the measuring for fluctuation in sensitivity of the received microwaves associated with changes in the temperature of said parabolic antenna itself;

comparing the intensity of the received, compensated microwaves with the intensity of microwaves of a reference noise source; and

determining the relative intensity of the received microwaves to obtain the surface temperature of the at least one steel piece corresponding thereto.

4,627,744

TEMPERATURE SENSOR UTILIZING THERMAL NOISE AND THERMAL COUPLE ELEMENTS, AND ASSOCIATED CONNECTING CABLE

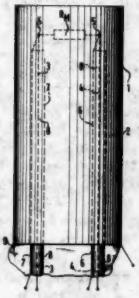
Heinz Brixy, Niederzier, and Hubert Hoewener, Aachen, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich GmbH, Julich, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,596

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325381

Int. Cl.[4] G01K *7/06, 7/30*

U.S. Cl. 374—175 **15 Claims**



1. A temperature sensor comprising:

a metallic protective casing;

a resistive element generating a temperature-dependent noise voltage and disposed within said casing and having at least one conductor independent from said casing extending therethrough in insulated relationship from said casing; and

a thermoelectric element in said casing having first and second leads forming a junction generating a temperature-dependent electromotive force, said conductor being tubular, composed of a nonmagnetic material, and surrounding only one of said leads while being electrically insulated therefrom, said noise voltage being measured across said tubular conductor and a further conductor independent from said one of said leads, said electromotive force being measured across said leads.

4,627,745

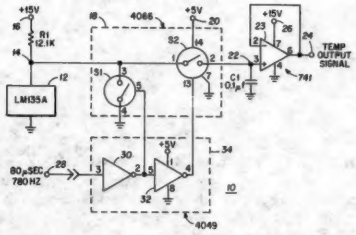
FAST RESPONDING TEMPERATURE TRANSDUCER CIRCUIT

Billie F. Rider, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 21, 1983, Ser. No. 553,739

Int. Cl.[4] G01K *7/00, 7/16*

U.S. Cl. 374—183 **15 Claims**



1. A method of sensing temperature using a temperature sensor coupled to provide an output voltage related to the sensed temperature, the improvement in said method comprising:

sampling said output voltage during at least one first time period to provide a signal representing temperature;

shorting said output voltage across said sensor during at least one second time period so that there is substantially no voltage output from said sensor during said at least one second time period;

providing said sampled output voltage as a temperature signal; and

repeating said sampling and shorting steps to intermittently interrupt current flow through said sensor at a rate sufficient to reduce heat dissipation causing temperature increases in said sensor and in turn reduce transient error in said output voltage indicating temperature.

4,627,746

HYDRO-DYNAMIC FLUID BEARING COMPRISING BEARING MEMBERS SUBJECT TO PROGRESSIVE PRE-LOADING

Charles H. Grisel, Bezons, and Henri Hus, Igny, both of France, assignors to Hispano-Suiza, Saint-Cloud, France

Filed Dec. 6, 1985, Ser. No. 805,747

Claims priority, application France, Dec. 6, 1984, 84 18592

Int. Cl.[4] F16C *32/06*

U.S. Cl. 384—99 **8 Claims**

1. In a hydro-dynamic fluid bearing assembly

a rotary shaft,

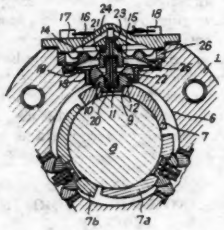
bearing members disposed around the rotary shaft with the interposition, in operation, of a pressure fluid film,

a bearing housing for said members,

a resilient member acting, when the shaft is stationary, on

one of the bearing members, so as to produce a limited pre-load on that member, and

means, operable during use of the assembly, to subject the said resilient means to the action of pressure fluid bled



from the film of pressure fluid lying beneath the bearing member so that the loading on the bearing member increases with the pressure of the fluid film as the rotational speed of the shaft increases.

4,627,747

DEVICE FOR BALANCING OF ROTORS WITHOUT JOURNALS

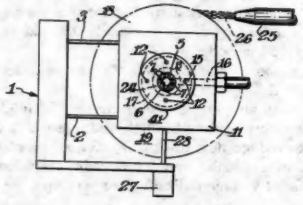
Harald Schönfeld, Darmstadt, and Angelo Bauer, Rossdorf, both of Fed. Rep. of Germany, assignors to Carl Schenck AG, Fed. Rep. of Germany

Division of Ser. No. 530,419, Sep. 8, 1983, Pat. No. 4,543,825. This application May 2, 1985, Ser. No. 729,630

Claims priority, application European Pat. Off., Sep. 25, 1982, 82108883.8

Int. Cl.[4] F16C *32/06*

U.S. Cl. 384—113 **2 Claims**



1. A bearing arrangement for balancing rotating bodies (rotors without journals) by meansuring vibration resulting from unbalance of the rotating body comprising a main support with a non-rotating arbor extending therefrom, the arbor having passages therein for the passage and delivery of fluid to the space between the exterior surface of the arbor and the inside surface of the body to be balanced via a plurality of circumferentially distributed openings, fluid supply means connected to supply the passages with fluid under pressure, means to rotate the body to be balanced relative to the main support and the arbor extending therefrom, the means to rotate the body to be balanced comprising a nozzle constructed and arranged to tangentially direct a stream of fluid onto the outside surface of the body to be balanced, and means to supply the nozzle with fluid under pressure.

4,627,748

WRITING-PLOTTING APPARATUS WITH KEYBOARD

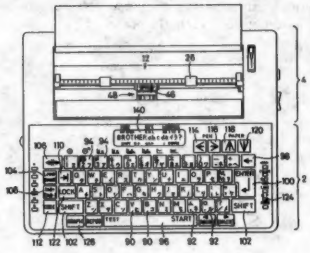
Kenji Mizuno, and Ryoichi Sasaki, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 21, 1985, Ser. No. 714,478

Claims priority, application Japan, Mar. 27, 1984, 59-60261

Int. Cl.[4] B41J *3/04*

U.S. Cl. 400—17 **9 Claims**



1. A recording apparatus capable of writing characters in a writing mode and plotting graphs in a plotting mode, comprising:

a keyboard having a multiplicity of keys including character keys corresponding to said characters, said keyboard being operable in a first mode in which at least numerals can be keyed in, and in a second mode in which letters and symbols can be keyed in;

a paper feeding device for supporting and feeding a sheet of paper in opposite directions;

a carriage supporting a writing instrument, and movable in a direction perpendicular to a line of feed of said sheet of paper;

control means for controlling the operations of said paper feeding device and said carriage, to write with said writing instrument in said writing mode the characters which are keyed in through said character keys with said keyboard placed selectively in said first or second mode, and to plot the graphs with said writing instrument in said plotting mode based on the operations of said multiplicity of keys with said keyboard placed in said first mode;

mode-memory means for storing, upon selection of said plotting mode, mode data indicative of one of said first and second modes which has been established in the writing mode before said selection of the plotting mode; and

automatic mode setting means for placing said keyboard into said first mode upon said selection of the plotting mode, and placing said keyboard, upon selection of said writing mode, into said one of the first and second modes which is represented by said mode data stored in said mode-memory means.

4,627,749

CHARACTER GENERATOR SYSTEM FOR DOT MATRIX PRINTERS

Joseph Meo, and Michael P. Taylor, both of Norwalk, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 21, 1984, Ser. No. 581,631

Int. Cl.[4] B41J *3/02;* **G06F** *3/12*

U.S. Cl. 400—121 **8 Claims**

1. A character generator system for supplying text information to a dot matrix printer whereby text including characters may be printed on a record member, comprising:

a data input for receiving information in the form of an M bit code representative of the text to be printed;

a microprocessor connected to said input for receiving therefrom the information in the form of the M bit code and including means for expanding the M bit code to an N bit code where N is greater than M;

a text buffer connected to said microprocessor for receiving and storing the expanded text information and outputting character start addresses;

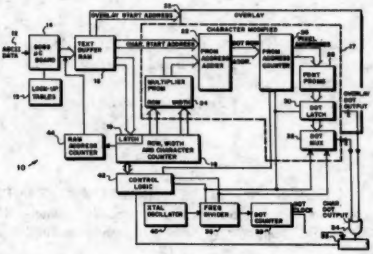
an address adder in connection with said text buffer for receiving character start addresses;

a first address counter connected to the said address adder;

a multiplier connected to said address adder;

a row, width and character counter connected to said multiplier and to said text buffer for receiving dot row addresses, character width and character height information;

a second address counter connected intermediate said microprocessor and said row, width and character counter for synchronizing the output of said text buffer with the output of said multiplier;



a plurality of font PROMs connected to said first address counter to receive pixel addresses and generate pixel information; and a control logic in connection with said row, width and character counter and said second address counter for synchronizing activities thereof

whereby;

said multiplier receives counts from said row, width and character counter and generates character address offsets, said address adder receives and adds the offsets from said multiplier and character start addresses from said text buffer to generate dot row addresses and said first address counter receives the dot row addresses from said address adder to generate pixel addresses that are received by said font proms in response to which said font proms generate pixel information.

4,627,750

RECEIVING ARRANGEMENT FOR A MULTIPLE TYPE CARRIER FOR AN IMPACT PRINTER

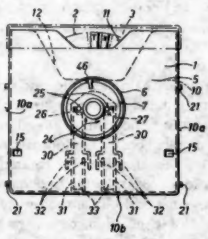
Arthur Kittel, Wilhelmshaven, and Heiner Gerken, Jever, both of Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Continuation of Ser. No. 40,214, May 18, 1979. This application Mar. 23, 1981, Ser. No. 246,696

Claims priority, application Fed. Rep. of Germany, May 22, 1978, 2822313

Int. Cl.⁴ B41J *1/30*

U.S. Cl. 400—144.2 **16 Claims**



1. In a combination including a print wheel provided with a plurality of elastic spokes carrying print type faces and a cassette carrying the print wheel for removably mounting the print wheel in an impact printer having a printing hammer mechanism arranged to act on the type faces, a rotatable setting shaft, connecting means for releasably fastening the print wheel to the setting shaft and holding members for holding the cassette in a mounted position in the printer, the improvement wherein: said print wheel comprises positioning means; said cassette comprises arresting means for normally engaging said positioning means in order to hold said print wheel in a predetermined angular position relative to said cassette when said cassette and print wheel are removed from the printer, said arresting means being disengageable from said positioning means when said cassette is in the mounted position in the printer and said printer wheel is fastened to the setting shaft; said positioning means comprise pin elements protruding axially from said print wheel; and said arresting means comprise two supporting tongues and support means supporting said tongues on said cassette for movement in the direction of the axis of said print wheel into a position where said tongues engage said pin elements, and further comprising control means mounted on the printer to act on said support means to disengage said tongues from said pin elements when said cassette is in said mounted position.

4,627,751

CONTROL APPARATUS FOR HAMMER TYPE IMPACT PRINTER

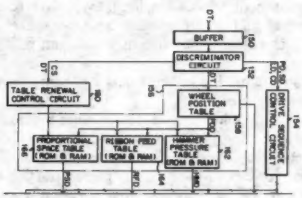
Yoshinori Nakajima, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 404,799, Aug. 3, 1982, abandoned. This application Jun. 17, 1985, Ser. No. 745,750

Claims priority, application Japan, Aug. 7, 1981, 56-123059

Int. Cl.⁴ B41J *1/30*

U.S. Cl. 400—144.2 **24 Claims**



1. A control apparatus for a hammer type impact printer comprising:

read-only storage means for storing a first code conversion table for a first rotary type element;

read-write storage means for storing a second code conversion table for a second rotary type element;

said read-only storage means further storing a third code conversion table for producing type position values for respective input character codes, the first and second code conversion tables producing hammer pressure values for the respective input character codes;

said first and second code conversion tables producing the hammer pressure values in response to the respective type position values from the third code conversion table; and

alteration means for altering a predetermined portion of the second code conversion table stored in the read-write storage means such that the data in the second code con-

version table after alteration constitutes a fourth code conversion table for a third rotary type element and discriminating means for discriminating data for altering the second code conversion table in the read-write storage means from input data and feeding the data to the alteration means.

4,627,752

DAISY WHEEL PRINTING DEVICE WITH VARIABLE HAMMER DELAY

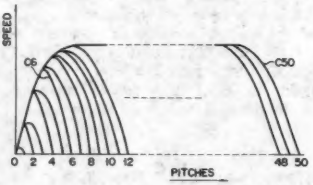
Norio Yagi, Shizuoka, and Akira Nuita, Mishima, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,456

Claims priority, application Japan, Oct. 7, 1983, 58-187935

Int. Cl.[4] B41J *1/30*

U.S. Cl. 400—144.2 **6 Claims**



1. A daisy wheel type printing device comprising:

a daisy wheel having a plurality of type holding members including type at the respective ends thereof;

means for determining the amount of daisy wheel rotation required to set the type designated by input character data to a printing position;

wheel driving means coupled to the determining means for rotating the daisy wheel such that when the rotation is for a Preset amount or less the daisy wheel is accelerated and immediately decelerated, whereas when the rotation is for more than said preset amount the daisy wheel is accelerated, then rotated at a contant speed, and finally decelerated;

a printing hammer including means for hitting the type set to the printing position;

timer means coupled to said determining means, said timer means including means responsive to arrival of the type designated by the input character data at the printing position for establishing a delay period starting at the time of such arrival and having a first duration when the daisy wheel is rotated by said preset amount or less, and a second duration which is shorter than said first duration when the daisy wheel is rotated by more than said preset amount; and

control means for driving the printing hammer when said delay period elapsed.

4,627,753

DAISY-WHEEL TYPE PRINTING SYSTEM WITH MULTIPLE FUNCTIONS

Hirotoshi Matsui, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 24, 1985, Ser. No. 694,676

Claims priority, application Japan, Jan. 27, 1984, 59-10447[U]; Jan. 27, 1984, 59-10448[U]

Int. Cl.[4] B41J *1/46*

U.S. Cl. 400—174 **12 Claims**

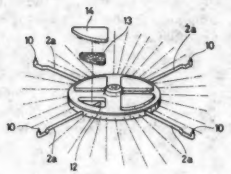
1. A daisy print wheel for use in a rotary wheel impact printer comprising:

a hub;

a plurality of type elements for impressing desired type characters on a desired surface;

a plurality of spokes radially extending from said hub, each said type element being supported at a selected distance from said hub by an associated said spoke;

a pen including means for supplying ink therethrough;



said plurality of spokes including a pen supporting spoke associated with and supporting said pen at said selected distance from said hub, said pen supporting spoke including an ink passage formed therethrough.

4,627,754

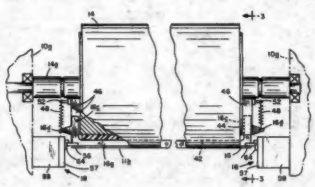
DRUM CLAMPING MECHANISM FOR A PRINTER

Albert A. Sholtis, Long Beach, and Jon S. Guy, Garden Grove, both of Calif., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 13, 1985, Ser. No. 765,078

Int. Cl.[4] B41F *21/04*; B41J *11/04*

U.S. Cl. 400—649 **12 Claims**



1. Drum clamping mechanism for a rotary printing drum having a surface for wrapping a sheet to be printed on, said drum having a first position which it assumes prior to printing on the sheet and a second position angularly displaced from the first position which it assumes after completion of printing on the sheet, said mechanism comprising

A. clip means extending along the length of the drum for clamping the leading edge of a sheet to the drum surface;

B. means for movably mounting said clip means to the drum so that the clip means are movable between

(1) an open position whereby a sheet-receiving gap is formed between said clip means and said drum surface, and

(2) a clamping position whereby the leading edge of a sheet positioned between the clip means and the drum surface is clamped to the drum so that, when the drum is rotated in one direction, the sheet is wrapped about the drum;

C. means for urging the lip means to said clamping position;

D. uni-directionaly deflectable cam means; and

E. means for mounting the cam means adjacent to the drum at a selected angular position about the rotary axis of the drum so that when the drum is rotated to said second position in said one direction, said cam means are deflected by the engaging clip means which thereupon remain in their closed position, but when said drum is rotated to said second position in the direction opposite said one direction, said clip means are unable to deflect said cam means but are cammed thereby to said open position.

4,627,755

PLATEN OF A PRINTER

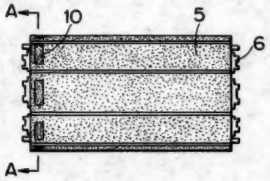
Masaru Moriyama, and Yoshio Yamaguchi, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 668,075

Claims priority, application Japan, Nov. 10, 1983, 58-173148[U]

Int. Cl.[4] B41J *11/02, 11/04, 11/057*

U.S. Cl. 400—662 4 Claims



1. An ink impregnated platen of a printer having a printing head, comprising: a platen base arranged opposite to said printing head and rotatable with respect to said printing head; a plurality of porous bodies made of a sintered resin and having a first density for absorbing inks of different colors, each of said bodies having a non-printing portion; means for detachably attaching said porous bodies to said platen base; a plurality of porous ink color indicating members made of the same sintered resin as said porous bodies and having a second density for absorbing inks of different colors, the second density of said indicating members being higher than the first density of said porous bodies, one of said ink color indicating members being embedded in each of said porous bodies at said non-printing portion thereof.

4,627,756

LEAD PROPELLING MECHANISM FOR A MECHANICAL PENCIL

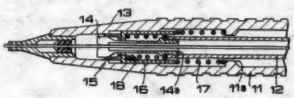
Hidehei Kageyama, Kawagoe, Japan, assignor to Kotobuki & Co., Ltd., Kyoto, Japan

Filed Aug. 13, 1985, Ser. No. 765,128

Claims priority, application Japan, Apr. 2, 1985, 60-48121[U]

Int. Cl.[4] B43K *21/22, 21/04*

U.S. Cl. 401—94 6 Claims



1. A lead propelling mechanism for a mechanical pencil comprising:

a lead chuck having a front end defining its head and a rear end, said chuck having on its outer peripheral surface a groove including a shoulder located adjacent to said rear end thereof;

a ring fitted loosely about said chuck for tightening said head thereof;

a sleeve having a front end contacting said ring; and

a coiled spring having a front end bearing on said front end of said sleeve and a rear end held by said shoulder, said rear end of said spring being adapted to bear against an adjacent end of a lead holding tube to urge said ring to tighten said head; and

said spring having a smaller diameter at its rear end portion defining said rear end, and a larger substantially uniform diameter in the remaining portion thereof, solely said smaller diameter rear end portion being contained within said groove.

4,627,757

WRITING INSTRUMENT WITH SIGNALING CAP

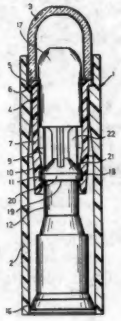
Christoph Manusch, Hanover, and Günter Scholz, Garbsen, both of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jan. 14, 1985, Ser. No. 691,456

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401739

Int. Cl.[4] B43K *9/00*

U.S. Cl. 401—194 13 Claims



1. A writing instrument comprising:

an elongated writing implement having a writing tip; and

a cap removably mounted on said implement and including:

a sleeve adapted to be fitted over said tip,

an elongated insert movable in said sleeve and receiving at least a portion of said tip at one end of said insert in a blind passage of said insert to protect said tip against drying out, said insert engaging said tip with a friction force,

threshold latching means in said sleeve engageable in said insert for retaining it with a threshold force greater than the friction force of said insert against said tip in a first position with said sleeve until said insert is fully seated on said tip whereby said threshold force is then exceeded and said insert is shifted in said sleeve to a second position, and said friction is sufficient to return said insert to said first position upon withdrawal of said sleeve from said instrument, said latching means including a latching ring fixed in said sleeve and formed with a plurality of axially extending inwardly biased spring tongues surrounding said insert and having surfaces of different inclinations engaging a shoulder formed on said insert and spaced from said end with said threshold force to retain said insert in said first position until said threshold force is exceeded, and

a signal pin on said insert fully visible only in said second position of said insert at a free end of said sleeve remote from said end of said insert receiving said tip.

4,627,758

NAIL POLISH REMOVING APPARATUS

Marilyn P. Winthrop, 54 Magnolia Hill Rd., West Hartford, Conn. 06117

Filed Apr. 29, 1985, Ser. No. 728,688

Int. Cl.[4] A45D *34/00, 34/04;* B05C *17/02*

U.S. Cl. 401—208 2 Claims

1. A nail polish removing apparatus, which comprises: an elongated hollow housing having a first opening at a first end thereof;

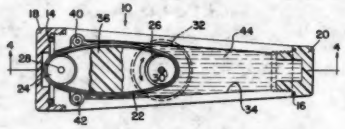
a reservoir for nail polish removing fluid disposed in said housing;

a continuous belt of absorbent material extending from said reservoir to said opening;

said apparatus further includes means for mounting said belt to permit axial portions of said belt to move from said reservoir to said first opening in said housing;

said means for mounting comprises first and second mounting rollers disposed at axially spaced points;

said means for mounting includes means extending out of



said elongated hollow housing for permitting manual rotation of one of said mounting rollers to cause axial portions of said belt to move from said reservoir to said first opening;

said apparatus further includes seal means extending across said housing and around said absorbent material to seal said reservoir at said first opening in said housing;

said seal means comprises elongated openings, said openings engaging discrete axial sections of said belt; and

said elongated openings are bounded by at least one rotatably mounted squeezing roller.

4,627,759

SCREW TYPE CONNECTOR SET

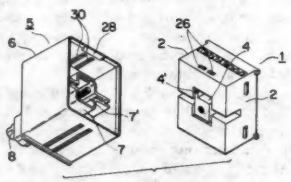
Shinichi Kato; Kiyoto Watanabe, both of Atsugi; Yoji Saito, and Akio Yamagata, both of Gotenba, all of Japan, assignors to Nissan Motor Company, Ltd., Yokohama and Yazaki Corporation, Tokyo, both of Japan

Filed Jun. 13, 1984, Ser. No. 620,302

Claims priority, application Japan, Jun. 17, 1983, 58-92025[U]

Int. Cl.[4] F16D *9/00*; F16P *5/00*

U.S. Cl. 403—2 **10 Claims**



1. A screw type connector set comprising:

a first connector member including a first housing, said first housing having an engaging portion in the form of a nut; and

a second connector member including a second housing, a support member fixed within said second housing and having a chamber to receive said engaging portion of the first housing therein, and a bolt rotatably extending within said chamber to be screwed into the nut, said bolt having a tapered stepped portion therein, and a stop member engaging said tapered stepped portion to prevent axial movement of said bolt relative to said second connector; and

said bolt having a constricted portion therein weaker than said connector members, whereby excessive torison applied to tightening said bolt will cause it to break at said restricted portion and permit disassembly of said first and second connectors.

4,627,760

PLATE HOLDER

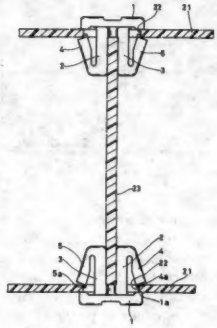
Masaru Yagi, Tsushima; Nobuaki Fujimoto, Okazaki, and Yoshitoki Hayashi, Aichi, all of Japan, assignors to Kitagawa Industries Co., Ltd., Nagoya, Japan and Kitagawa Industries Co., Ltd., Nagoya, Japan

Filed Jul. 2, 1985, Ser. No. 751,212

Claims priority, application Japan, Jul. 24, 1984, 59-112236[U]

Int. Cl.[4] F16B *9/02*

U.S. Cl. 403—201 **4 Claims**



1. A plate holder for securing a first plate to a second plate, said plate holder comprising:

a plate like base having means for engaging one surface of said first plate;

first and second substantially parallel resilient holding plates fittable through an aperture in said first plate, each said holding plate having one end connected to one surface of said base and freely extending from said base without mutual contact to define a second plate holding space therebetween;

elastic non-return pieces each having a first end connected to a distal end of one said holding plate and extending toward said base to a second end adjacent said base; and

means on said second end of each said non-return piece for engaging an edge defined between another surface of said first plate and said aperture when said holding plates are fitted through said first plate;

whereby the engagement of said means for engagement with said first plate when said second plate is in plate holding space resiliently presses said holding plates together to hold said second plate in said second plate holding space.

4,627,761

RETAINER

Gene E. Olson, Kenosha, and Norbert J. Kot, Milwaukee, both of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

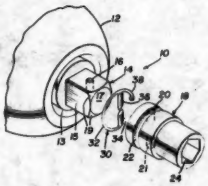
Filed Sep. 28, 1984, Ser. No. 655,234

Int. Cl.[4] B25G *3/26*; B25B *23/16*

U.S. Cl. 403—324 **11 Claims**

1. A retainer for interconnecting a polygonal stud in the polygonal bore of an outer tubular member, the outer tubular member having diametrically opposed first and second apertures, the stud having a transverse hole therethrough, said retainer being of one-piece construction and comprising an elongated flexible arm having first and second ends and first and second fingers of substantially the same length formed integrally with said arm in spaced relation along said arm and extending laterally from said arm near opposite ends thereof, said first finger being positionable through the first aperture and into one end of said hole, said second finger being positionable through the second aperture and into the other end of said

hole, with free ends of said first and second fingers being located adjacent to one another in said hole of said stud in substantially abutting relationship when so positioned, the length of said arm between said first and second fingers being



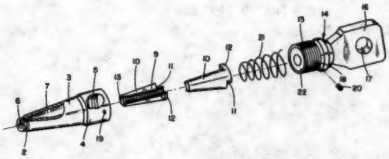
no more than half the circumference of the outer tubular member whereby said arm is positioned in tight fitting relation around the periphery of the outer tubular member when said fingers are located within respective apertures of the outer tubular member.

4,627,762

DEVICE FOR RAPIDLY FIXING THE ENDS OF CABLES AND THE LIKE

Marino D. Scotti, Milan, Italy, assignor to Douglas Marine s.r.l., Milan, Italy

Filed Jun. 28, 1985, Ser. No. 749,667
Claims priority, application Italy, Nov. 2, 1984, 23688/84[U]
Int. Cl.[4] B25G *3/20*; F16B *2/00*
U.S. Cl. 403—369 9 Claims



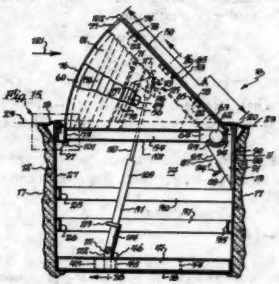
1. A device for rapidly fixing cables, ropes and the like to support, which comprises (1) a base (a) having an opening (6) and a tapered orifice (7) in the interior thereof; (2) a conical body (8) housed within the said tapered orifice, said conical body (8) consisting of two elements (10) which form a central threaded opening (9), said elements (10) being held among themselves to prevent relative longitudinal displacement but capable of radial displacement; (3) a spring (21) urging against said conical body (8), said elements (10) being so shaped whereby one is a male element and the other is a female element; said base (1) having an opening (5) at the distal end for the entry of said cable, (4) a head (14) closing the end (4) of said base (1) opposite to said distal end, said head (14) having a threaded portion (15), said end (4) being internally threaded (5), said threaded portion (5) engaging with said threaded portion (15), said head (14) being provided with means (16–17) for fixing to a support, wherein said two elements (10) which form said conical body (8) are identical and each one is provided with a recess (11) and a projection (12) the projection of each element engaging the recess of the other element.

4,627,763

VEHICLE BARRIER CONSTRUCTION

Mitchel B. Roemer, Amherst, and Nicholas B. Roemer, Elma, both of N.Y., assignors to Roemac Industrial Sales, Inc., North Tonawanda, N.Y.

Filed Jul. 3, 1984, Ser. No. 627,445
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 15 Claims



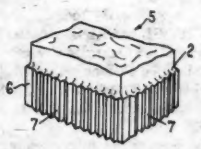
14. A vehicle barrier comprising a housing, a barrier having a roadway surface and a barrier surface, means for mounting said barrier for movement between a retracted position where said roadway surface lies substantially flush with a roadway and an extended position where said barrier surface obstructs a vehicle on said roadway, motor means effectively located between said housing and said barrier for moving said barrier between said retracted position and said extended position, and cooperating means on said housing and on said barrier for effecting automatic alignment between said barrier and said motor means upon installation of said barrier means into said housing, said cooperating means comprising a support for orienting said motor means in a predetermined position, and guide means on said barrier for guiding motor means into engagement with said berrier means, said motor means comprising a piston and cylinder, and said support orienting said cylinder in a predetermined alignment, and said guide means comprising funnel-like means for guiding said piston into operative relationship with said barrier.

4,627,764

PAVING STONE, PROCESS FOR MANUFACTURING SAME AND DEVICE FOR CARRYING OUT THE MANUFACTURING PROCESS

Rolf Scheiwiller, Beichelacker, 3115 Gerzensee, Switzerland

Continuation of Ser. No. 358,036, Mar. 15, 1982, abandoned.
This application Jan. 17, 1985, Ser. No. 692,329
Claims priority, application European Pat. Off., Mar. 25, 1981, 81810120
Int. Cl.[4] E01C *5/00*
U.S. Cl. 404—41 11 Claims



1. A paving stone comprising:
a lower portion having at least three vertical faces with each vertical face having a upper edge, and at least one of the

faces having a plurality of vertical, regularly-spaced ribs; and

an upper portion, integrally connected atop said lower portion; having a plurality of vertical sides equal in number to the vertical faces and respectively integral with and offset inward from the upper edge of a respective one of the vertical faces, the upper portion further having an upper surface, said upper portion having a horizontal cross section of different configuration than a horizontal cross section of said lower portion.

4,627,765

TUNNELING MACHINE

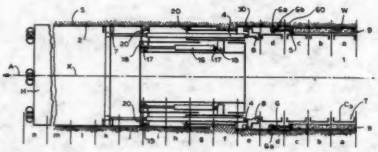
Volker Hentschel, Dorsten, Fed. Rep. of Germany, assignor to Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann, Essen, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 674,895

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342903

Int. Cl.[4] E21D *9/08*

U.S. Cl. 405—146 **6 Claims**



1. A tunneling machine comprising:

a leading shield adapted to be advanced with an excavating head in a subterranean structure to form a tunnel having a tunnel wall along which said leading shield is advanced in a tunnel-advance direction;

a trailing shield disposed along said wall rearwardly of said leading shield with respect to said direction;

a telescoping shield assembly bridging said leading shield and said trailing shield and having an outer portion connected at a joint to a rear edge of said leading shield and receiving an inner portion connected to said trailing shield, said portions being telescopingly connected for contraction and extension of said shield assembly;

a plurality of angularly spaced first cylinder units pivotally connected to said leading shield and adapted to advance said leading shield relative to said trailing shield and along said tunnel, and to draw said trailing shield from said leading shield;

a plurality of second cylinder units interconnecting said portions of said assembly for contracting and extending said assembly independently of the advance of said leading shield; and

a form connected to said trailing shield by a plurality of third cylinder units for defining a concrete emplacement front within said trailing shield.

4,627,766

MULTI-PURPOSE MARINE BARRIER SYSTEM

Maurice C. Marquet, 2188 Oakridge Crescent, R.R. #5, Abbotsford, British Columbia, Canada V2S 4N5

Filed Mar. 13, 1986, Ser. No. 840,413

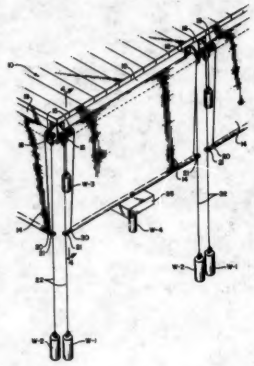
Int. Cl.[4] E02B *17/00*

U.S. Cl. 405—195 **22 Claims**

1. A barrier system for use in concealing the above water exposed portions of piles used to support a waterfront structure and for converting the vertical plane outboard of the exposed portions of the piles between the waterline and the level of the waterfront structure supported on the piles to utilitarian space, said barrier system comprising, in combination:

(a) fine mesh screen having upper and lower vertically spaced apart parallel edges;

(b) means for suspending said screen along it's upper edge from the waterfront structure in the region of the upper ends of the piles and outboard thereof; and,



(c) means for maintaining said lower edge of said screen in the same vertical plane containing said upper edge of said screen with said lower edge of said screen adjacent to the waterline so that said screen effectively conceals the piles from visual observation while simultaneously presenting a surface for display of graphic media.

4,627,767

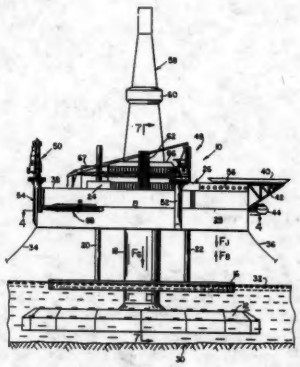
MOBILE SEA BARGE AND PLATFORM

Almeron J. Field, Los Angeles; Daniel G. Whyte, and Gerald L. Johnson, both of Orange, all of Calif., assignors to Santa Fe International Corporation, Alhambra, Calif.

Continuation of Ser. No. 516,371, Jul. 22, 1983, abandoned. This application Jan. 9, 1986, Ser. No. 816,993

Int. Cl.[4] E02B *17/00*

U.S. Cl. 405—196 **43 Claims**



1. 1 A mobile barge having both surface-floating and bottom-resting modes of operation comprising:

a unitary lower hull having sufficient buoyancy to permit said barge to have a surface-floating operational mode and having a bottom surface adapted for providing gravity-forced contacting support from the sea floor when said barge is in the bottom-resting mode;

a vertically positioned support member centrally mounted in and extending above said lower hull;

an upper hull connected to the top end portion of said support member, said upper hull containing equipment for conducting barge operating functions;

a stabilizing hull arranged about said support member and adapted for controlled movement between a position adjacent to the top surface of said lower hull to a position adjacent to the bottom surface of said upper hull; and

a control means for providing motive force to enable movement of said stabilizing hull with respect to said upper hull and for transmitting buoyancy force from said stabilizing hull to the remainder of said barge, with said stabilizing hull continuously movable vertically between said upper and lower hulls to position and maintain said stabilizing hull at the water line for various depths of submergence of said lower hull and to position said stabilizing hull out of the water while said lower hull is in the bottom-resting mode;

with said stabilizing hull adapted to provide controlled bottom founding of said barge from a surface-floating mode to the bottom-resting operational mode.

4,627,768

LOCKING DEVICE FOR OIL PLATFORMS

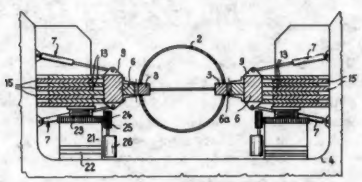
Pierre-Armand Thomas, Puteaux, and Jean-Claude Naudin, Paris, both of France, assignors to Technip Geoproduction, Paris la Defense, France

Filed Feb. 28, 1985, Ser. No. 706,749

Claims priority, application France, Feb. 28, 1984, 84 03066

Int. Cl.⁴ E02B *17/08*; B66F *1/00*

U.S. Cl. 405—198 **10 Claims**



1. A locking device in combination with a self-raising oil platform which comprises legs, a shell mounted to be movable along the legs, raising mechanisms for moving the shell along the legs including racks mounted on at least a part of the length of the legs, said device being associated with each rack and comprising a toothed member having a part constituting a counter-rack mounted on the shell of the platform, means for displacing said toothed member transversely of the rack with which the device is associated for selectively engaging the teeth of said toothed member in the teeth of the rack and disengaging them from the teeth of the rack, clamping elements constituting plates connected to said toothed member, clamping elements constituting counter-plates connected to said platform, said plates and counter-plates having interengageable surfaces contained in parallel planes and being freely relatively movable in a given direction substantially perpendicular to said planes between a first position in which they are spaced apart and a second position in which said surfaces are interengaged, and means cooperative with the plates and counterplates for clamping substantially in said given direction said plates and counter-plates in said second position and ensuring the locking of said toothed member in position on said rack.

4,627,769

CONCRETE FOUNDATION PILE

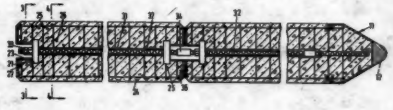
Paul Lee, 602-608 Nathan Rd., 19th Fl., Kowloon, Hong Kong

Filed Dec. 22, 1980, Ser. No. 218,711

Claims priority, application United Kingdom, Jan. 14, 1980, 8001147

Int. Cl.⁴ E02D *5/30, 7/02*

U.S. Cl. 405—256 **7 Claims**



1. A concrete pile comprising a concrete body, an end wall of the concrete body having a recess therein, a steel anchorage plate set in the concrete body and having at least a portion of one face thereof exposed in said recess, a central reinforcement bar within the body releasably connected to the steel anchorage plate, a capping plate disposed over the end wall of the body, the capping plate being formed with an opening for access to the recess and the reinforcement bar and a steel tube lining the recess and extending from beneath the capping plate to the face of the anchorage plate so that the load of hammer blows on the capping plate are spread to the anchorage plate through the steel tube.

4,627,770

GEAR CUTTER

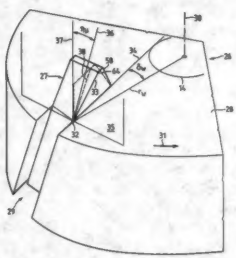
Erich Kotthaus, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Feb. 28, 1983, Ser. No. 470,485

Claims priority, application Switzerland, Mar. 16, 1982, 1626/82

Int. Cl.⁴ B26D *1/12*

U.S. Cl. 407—21 **6 Claims**



1. A face cutter head for configuring the tooth bearing pattern of gears containing teeth having an arcuate cycloid shape and moving in a predetermined direction during a continuous gear teeth cutting operation, comprising:

a predetermined number of cutters arranged in said face cutter head;

each cutter of said predetermined number of cutters defining at least one predetermined cutting edge;

a cutter radius;

an orientation line;

said orientation line and said cutter radius defining a plane which is essentially parallel to an end face of said face cutter head;

a normal plane extending essentially perpendicular to said orientation line;

said orientation line intersecting said cutter radius in said normal plane and being inclined with respect to said cutter radius by a predetermined orientation angle;

each of said cutters defining a rake surface thereof;

said orientation line lying within said rake surface irrespective of a possible rake angle defined between said rake surface and said normal plane; and

a projection of a selected one of an inner cutting edge and an outer cutting edge defined by said at least one predetermined cutting edge into said normal plane appearing inclined by an undercut angle with respect to a line extending normally with respect to said plane which is parallel to said end face of said face cutter head such that an end of said at least one predetermined cutting edge remote from said end face leads as viewed in the direction of movement of said face cutter head for configuring the tooth bearing pattern by an effective twisting of a longitudinal tooth flank line and an effective curvature of a tooth flank.

4,627,771

MILLING-CUTTER

Walter Kieninger, An den Stegmatten 7, D-7630 Lahr 17 (Mietersheim), Fed. Rep. of Germany

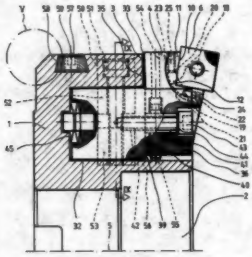
PCT No. PCT/EP84/00147, § 371 Date Jan. 16, 1985, § 102(e) Date Jan. 16, 1985, PCT Pub. No. WO84/04478, PCT Pub. Date Nov. 22, 1984

PCT Filed May 16, 1984, Ser. No. 694,520

Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317916

Int. Cl.[4] B26D *1/00*

U.S. Cl. 407—39 **20 Claims**



1. A milling tool, comprising:

a disc-shaped base member (1) having a central securement bore (2) and a plurality of substantially equidistantly spaced retainer cutouts (3) disposed about the perphery of said base member and open towards a front face of said base member (1);

a plurality of cutting plate supports (4), each said support (4) being disposed in and including means to adjustably secure said supports to one of said plural retainer cutouts (3) so that said support (4) is independently movable and fixable in an axial and in a radial direction with respect to said disc-shaped base member (1);

a plurality of cutting plates (6), each said cutting plate (6) being carried by one of said supports (4) so that its main plane is oriented in a generally radial direction;

a plurality of cutting plate spacers (11), each said spacer (11) having a cutout (10) and each said cutting plate (6) being located in one of said cutting plate spacer cutouts (10); each said cutting plate spacer cutout (10) substantially matching the shape of the cutting plate (6) located therein; and

a plurality of first adjustable securement means, each mounting one of said cutting plate spacers (11) to a respective one of said cutting plate supports (4) so that the cutting plate spacer (11) is independently rotatable about an axis defined substantially perpendicular to a radial plane containing a central axis (5) of said base member (1) and so that said cutting plate spacer (10) is independently positionally fixable relative to said respective cutting plate support (4) by said first adjustable securement means.

4,627,772

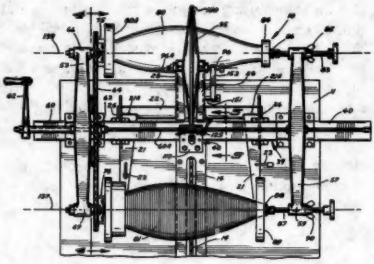
CARVING ATTACHMENT FOR TABLE SAWS

Paul S. Petersen, Minnetonka, Minn., assignor to Newmark, Inc., Minneapolis, Minn.

Filed Aug. 23, 1984, Ser. No. 643,658

Int. Cl.[4] B23D *45/02*

U.S. Cl. 409—121 **16 Claims**



1. For use in combination with a circular saw assembly having a saw table with a table surface, and a saw blade rotatable about an axis generally parallel to the table surface protruding above the table surface, a carving attachment including:

a base mountable on a table surface of a saw table adjacent to said saw blade;

a carriage mounted on said base for rocking movement about a rocker axis generally transverse to the plane of the saw blade, said carriage including headstock means and tailstock means spaced apart along said carriage, said headstock means and tailstock means each comprising arms extending transversely to the rocker axis so that when mounted on a saw table first ends of each of the headstock and tailstock arms are on an opposite side of the rocker axis from the saw balde, and second ends of the headstock and tailstock arms are adjacent a saw blade of a circular saw assembly on which the carving attachment is mounted with a plane of such saw blade between the headstock and tailstock arms, respectively;

first means to support a pattern between the first ends of the headstock and tailstock arms;

second means to support a workpiece between second ends of said headstock and tailstock arms, with the workpiece generally above the cutting edge of the saw blade of a circular saw assembly on which the carving attachment is mounted;

a pair of upright arms mounted on the base between the headstock and tailstock arms;

a tracer wheel mounted on the upright arms in position to engage a pattern held between the first ends of the headstock and tailstock arms and rotatably mounted about an axis that is fixed relative to the base and above the table surface on which the base is mounted, said tracer wheel comprising a pair of dish-shaped plates spaced apart to have a maximum width dimension along the axis of rotation adjacent such axis of rotation, and said plates tapering in toward a bisecting plane at the outer rim of the plates, said plates being fixed together at the outer rim to form a narrow edge for engaging a pattern;

means for simultaneously rotating the first means and second means, and;

separate means driven with the means to rotate to move said carriage in direction generally along the rocker axis at the same time the means to rotate is operated, whereby as the tracer wheel follows a pattern held in the headstock and

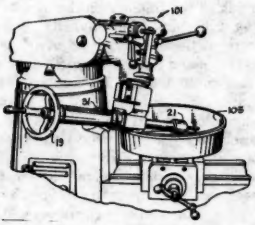
tailstock arms, the carriage will tilt about the rocker axis, and will be moved in direction along the rocker axis.

4,627,773

RIGHT ANGLE SPINDLE FOR MACHINE TOOLS

Richard E. Ehnert, 690 Persian Dr., #82, Sunnyvale, Calif. 94086

Filed Apr. 13, 1981, Ser. No. 253,898
Int. Cl.[4] B23C 1/12
U.S. Cl. 409—215 8 Claims



1. A system for advancing and retracting a rotating tool such as a drill bit, comprising,

a uniform diameter screw colinear with a lengthwise axis of a hollow headstock, the hollow headstock terminating at one end in an annular collar, the hollow headstock having a peripheral lengthwise keyway, and terminating at another end in a tool holding member,

a feed nut having a threaded section adapted to engage threads of the screw and an adjacent hollow section seating an annular thrust bearing, the screw passing through the thrust bearing, the hollow section terminating in a rim engaging said collar whereby the collar may rotate relative to the rim but may not move lengthwise with respect thereto,

a rotating quill, supported in a housing by opposed bearings, the quill disposed coaxial with the screw, but fixed relative to axial motion, said quill having a lengthwise keyway adapted to communicate rotational motion by slidably engaging the hollow headstock keyway and simultaneously permitting lengthwise bidirectional motion of the headstock along the keyway, whereby lengthwise motion may be transferred to the hollow headstock by the screw while simultaneously the headstock is rotating, said quill having a first gear connected coaxially thereto, and

power shaft means having a second gear extending at a right angle to the first gear of the quill and meshing therewith at all times for causing quill rotation, thereby rotating the headstock.

4,627,774

LIMITING TORQUE BOLT-NUT ASSEMBLY

Earl T. Bradley, Frisco, Tex., assignor to Eban Iron Inc., Eastland, Tex.

Filed May 23, 1985, Ser. No. 737,807
Int. Cl.[4] F16B 23/00, 35/06
U.S. Cl. 411—5 12 Claims

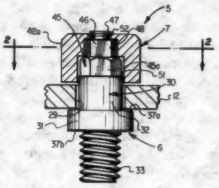
1. A torque limiting bolt-nut assembly comprising:

a bolt having a threaded shank;

a secondary drive head on said shank;

a shearable primary drive head on said secondary drive head; and

a hollow drive nut over said primary and secondary drive heads and a portion of said shank, said drive nut being



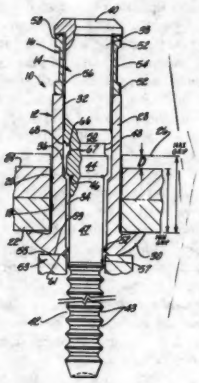
adapted to turn said primary drive head and being rotatable relative to said secondary drive head and said shank.

4,627,775

BLIND FASTENER WITH GRIP COMPENSATING MEANS

Richard D. Dixon, San Juan Capistrano, Calif., assignor to Huck Manufacturing Company, Irvine, Calif.

Filed Sep. 1, 1983, Ser. No. 528,449
Int. Cl.[4] F16B 13/04
U.S. Cl. 411—34 15 Claims



1. A blind fastener for securing a plurality of workpieces having aligned openings and a combined total thickness varying from a preselected minimum thickness to a preselected maximum thickness with the difference therebetween being the grip range for the fastener and with the workpieces having a front surface and an opposite rear surface, said fastener comprising:

a hollow sleeve having a through bore,

said sleeve having a sleeve shank portion and an enlarged sleeve head at one end, said sleeve head adapted to engage the front surface of the workpieces and said sleeve shank portion adapted to be located within said aligned openings within a preselected minimum and maximum clearance,

a pin,

said pin having a shank portion and an enlarged pin head,

said pin shank portion adapted to be located within said bore of said sleeve with said pin head located at the end of said sleeve shank portion opposite said sleeve head,

said pin adapted to move relative to said sleeve shank portion and to cause deformation of the same to form a blind head opposite said sleeve head in response to a relative axial force applied between said pin and said sleeve, said pin shank portion having a breakneck groove and being adapted to locate said breakneck groove at a generally uniform preselected position relative to said sleeve head

when said fastener is applied to workpieces having a total thickness within the grip range between said preselected minimum and maximum thicknesses,

grip compensating means located between said pin head and said opposite end of said sleeve shank and actuable to form said blind head from said sleeve shank and locate said breakneck groove at said generally uniform preselected position with said blind head formed,

said grip compensating means moving within said bore of said sleeve to form said blind head and deforming radially to a greater extent from said minimum to said maximum thickness whereby the application of said fastener to workpieces varying in total thickness over said grip range is compensated by the magnitude of radial deformation of said compensating means,

said pin having an enlarged diameter, extruding land portion,

said through bore of said sleeve having a reduced diameter lock forming bore portion located substantially within said shank portion in radial alignment with said aligned openings over a substantial axial length and having a preselected interference with said extruding land portion whereby there will be excess material of said lock forming portion relative to said minimum and maximum clearance as said extruding land portion is moved therethrough, a lock groove located in said pin generally immediately adjacent said extruding land portion,

said extruding land portion being movable within said lock forming bore portion for radially expanding said sleeve shank to fill said clearance with said aligned openings and to move said excess material into said lock groove to form a lock between said pin and said sleeve, said extruding land portion having a leading surface extending generally transversely to the pin axis, said leading extruding land surface terminating in a radially outer surface for engaging said lock forming bore portion and being generally inclined in a direction towards said pin head whereby shearing of said lock forming bore portion is inhibited,

said lock groove being substantially wide and being contoured to have a relatively flat root with a preselected depth to define a desired volume such that at said maximum clearance said lock groove will be filled by said excess material across its axial width but not to its full depth and at said minimum clearance said excess material will generally not exceed said desired volume when said pin has moved to locate said breakneck groove at said preselected position,

said lock forming bore portion communicating with an enlarged bore portion and extending in said sleeve shank generally from said sleeve head to a position around the location of said opposite rear surface at said minimum thickness of workpieces, a sleeve lock shoulder defined by the juncture of said lock forming bore portion and said enlarged bore portion, said outer surface of said leading extruding land surface having a maximum diameter to be snugly received within said enlarged bore portion,

said lock groove having a width approximately one-third of the axial length of engagement of said lock forming bore portion by said extruding land portion.

4,627,776

FASTENER

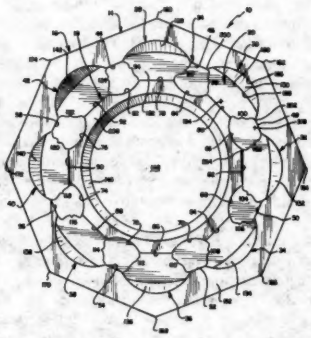
W. Richard Pamer, and James A. Zils, both of Parma, Ohio, assignors to Russell, Burdsall & Ward Corporation, Brooklyn Heights, Ohio

Continuation-in-part of Ser. No. 733,978, May 14, 1985. This application Dec. 2, 1985, Ser. No. 803,727

Int. Cl.[4] F16B *37/04*

U.S. Cl. 411—179 **9 Claims**

1. A fastener adapted to be received in a member and held against axial and rotational movement relative to the member by interaction between the member and said fastener, said fastener comprising a head section having a central axis, a shank section extending axially outwardly from said head section and having a central axis coincident with the central axis of said head section, said head and shank sections including surface means for defining an internal thread convolution extending axially through said head and shank sections, said head section including a rim which extends axially along said shank section, said rim of said head section and said shank section cooperating to at least partially define a generally annular groove which extends around said shank section and has a generally annular bottom surface which faces axially outwardly toward an outer end portion of said shank section, said groove being adapted to receive the material of the member upon mounting of the fastener on the member, said shank section including a plurality of axially extending indentations having inner end portions disposed adjacent to the bottom surface of the groove and outer end portions disposed in the outer end portion of said shank section, said shank section including a plurality of axially extending side surfaces disposed between the indentations in said shank section and having inner end portions disposed adjacent to the bottom surface of the groove and outer end portions disposed in the outer end portion of said shank section, said indentations and said side surfaces of said shank section cooperating to form a radially inner and axially extending side wall of the groove, said indentations in said shank section intersecting said side surfaces of said shank section to form axially extending corners which apply shear forces to the material of the member upon application of



torque loads to said fastener, said rim having a bearing surface which extends transverse to the central axis of said shank section and which faces axially outwardly toward the outer end portion of said shank section and which is engageable with the material of the member, said rim including a plurality of axially extending indentations having inner end portions disposed adjacent to the bottom surface of the groove and outer end portions adjacent to said bearing surface, said rim including a plurality of axially extending side surfaces disposed between the indentations in said rim and having inner end portions disposed adjacent to the bottom surface of the groove and outer end portions disposed adjacent to said bearing surface, said indentations and said side surfaces of said rim cooperating to form a radially outer and axially extending side wall of the groove, said indentations in said rim intersecting said side surfaces of said rim to form axially extending corners which apply shear forces to the material of the member upon application of torque loads to said fastener, each of said side surfaces of said rim being disposed radially outwardly of at least a portion of one of said indentations in said shank section to form a plurality of first constriction means for applying deformation forces to the material of the member at a plurality of locations disposed between said indentations in said shank section and

said side surfaces of said rim upon application of torque loads to said fastener, each of said indentations in said rim being disposed radially outwardly of at least a portion of one of said side surfaces of said shank section to form a plurality of second constriction means for applying deformation forces to the material of the member at a plurality of locations disposed between said side surfaces of said shank section and said indentations in said rim upon application of torque loads to said fastener, said fastener and member cooperating to resist relative rotation under the combined influence of cold working forces applied to the material of the member by said first and second constriction means and of shear forces applied to the material of the member by the corners of said rim and shank section.

4,627,777

ATTACHMENT MEANS

Eskil T. Johansson, Sunnanvindsvägen 1, S-58272 Linköping, Sweden

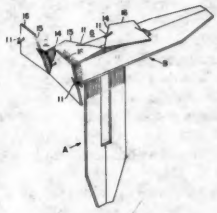
PCT No. PCT/SE83/00316, § 371 Date May 7, 1984, § 102(e) Date May 7, 1984, PCT Pub. No. WO84/00991, PCT Pub. Date Mar. 15, 1984

PCT Filed Sep. 7, 1983, Ser. No. 609,076

Claims priority, application Sweden, Sep. 7, 1982, 8205064

Int. Cl.[4] F16B *15/00*

U.S. Cl. 411—439 **3 Claims**



1. Attachment means comprising at least two identical parts each part comprising:

an elongated section having a first portion with substantially parallel long sides and a second portion which tapers toward a first end, said elongated section comprising a longitudinal bend centered between said long sides so that said elongated section is V-shaped in cross-section;

a head member attached to said elongated section at its second end, said head member comprising two trapezoidal-shaped head parts, each trapezoidal-shaped head part having shorter and longer parallel sides, said head parts being attached to the edge of said elongated section at right angles thereto along said longer parallel sides, said sides being placed next to each other, the combined length of said long parallel sides being greater than the width of said elongated section, said head member extending outwardly from said elongated section in the direction opposite to said V-shaped bend, and

a slot in said elongated section having an unobstructed portion, said slot coinciding with said longitudinal bend, and the width of said unobstructed portion of said slot defined perpendicular to the longitudinal bend and the length of said unobstructed portion of said slot defined parallel to the longitudinal bend are selected to allow insertion of one said identical part into the slot of the other said identical part with a friction fit, whereby said long sides of said elongated section of one said identical part and its bend engage the opposite edges of the slot of said other identical part.

4,627,778

Patent Not Issued For This Number

4,627,779

DEVICE FOR WITHDRAWING AND UNLOADING CROP-ENDS OF METAL BARS FROM A BAR PUSHER

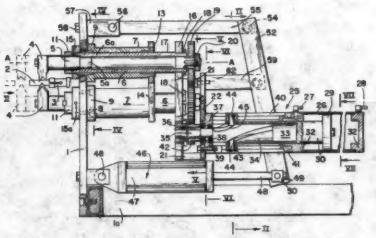
Giovanni Cucchi, and Pietro Cucchi, both of Bussero, Italy, assignors to F.LLI Cucchi S.r.l., Milan, Italy

Filed May 15, 1985, Ser. No. 734,071

Claims priority, application Italy, May 31, 1984, 21190 A/84

Int. Cl.[4] B23Q *5/22*

U.S. Cl. 414—17 **14 Claims**



1. A device for use with an equipment for feeding metal bars to a multi-spindle lathe, suitable for drawing the crop-end of said bars out a bar pusher and unloading said crop-end in a unloading area, and suitable also for introducing one end of said metal bars into said bar pusher, comprising a pair of jaws rotatable for clamping and unclamping said crop-end and sliding longitudinally along the feeding axis of said bars, each jaw being supported by an associated rotary shaft contained within a sleeve member, each sleeve member being slidably

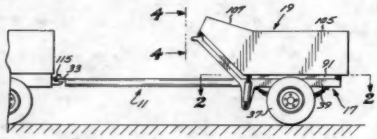
contained within an associated support member fixed to a stationary frame, said shafts being connected to means for causing the rotary movements of said shafts, and said sleeve members being connected to means for causing the sliding movements of said sleeve members, characterized in that said means causing the rotary movements of said shafts (5) include at least one operative piston (25) suitable for transforming the sliding movements of a member movable along an axis generally parallel to the axis along which said sleeve members (6) are moving into rotary movements of a further member kinematically connected to said shaft (5).

4,627,780

FORWARDLY DUMPABLE TRAILER

Ethiel L. Munz, P.O. Box 1383, Hawaiian Gardens, Calif. 90716

Filed Feb. 1, 1985, Ser. No. 697,456
Int. Cl.[4] B60P *1/16*
U.S. Cl. 414—346 **5 Claims**



1. A forwardly dumpable trailer to be hauled behind a truck having a trailer hitch and an upwardly opening box, said trailer comprising:

a transverse support axle;

an intermediate frame carried on said axle, including longitudinally extending slides;

latch means mounted on said intermediate frame and including lock and unlock modes;

a trailer frame including at least one forwardly and rearwardly extending rail formed with tracks slidably receiving said slides for slidable travel longitudinally therealong, to shift said intermediate frame from a transport location at the rear of said trailer to a forward position adjacent said truck box;

hitch means at the forward end of said trailer frame for hitching to said trailer hitch;

a latch element on said trailer frame, engageable with said latch means when said intermediate frame is in said transport location to lock said trailer frame against shifting relative to said intermediate frame and releasable from said latch means when said latch means is in said unlock mode;

a trailer box mounted on said intermediate frame for receiving a load and pivotally connected thereto at its front extremity to accommodate tilting of the rear end of said trailer box upwardly to a forward dump position;

said trailer box being formed at its forward extremity with a forwardly opening dump chute arranged to, when said trailer box is in said forward position, and also in said forward dump position, dump said load in said truck box; and

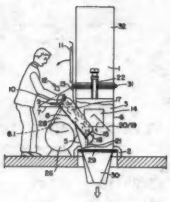
lift means coupled between said intermediate frame of said trailer box for tilting selectively said box to said forward dump position whereby said intermediate dump frame, and support axle, may be selectively shifted to said rearward transport position on said rails and latched in position by said latch means, and may be subsequently shifted to said forward position and said lift means actuated to raise the rear end of said dump box to said forward dump position to thereby cause said load to be dumped out said chute into said truck box.

4,627,781

BAG CUTTING-AND EMPTYING-DEVICE WITH CONNECTED COLLECTIVE DUST-REMOVAL FILTER

Klaus Borgner, Hirzenhain, Fed. Rep. of Germany, assignor to Luco-Technic GmbH Verfahrenstechische Anlagen, Ortenberg, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,549
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340894
Int. Cl.[4] B65B *69/00*
U.S. Cl. 414—412 **10 Claims**



1. A bag cutting and emptying device, comprising:

a substantially closed housing, said housing including front, rear, and sidewalls, said housing having an opening therein for receiving a bag to be cut and emptied, said sidewalls being double-walled and having lateral projections,

a flexible apron substantially covering said opening,

dust removal means extending into said housing,

a horizontal support table adjoining said housing, said support table being located between said lateral projections,

a bag chute connected to said support table, said bag chute extending downwardly into said housing,

an actuable stop flap located adjacent the lowermost portion of said bag chute, said stop flap being pivotable between a support position and an emptying position,

first fluid pressure means associated with said stop flap for actuating said stop flap,

an actuable knife for opening said bag, said knife being located inside said housing, said knife being pivotable about an axis when actuated.

second fluid pressure means associated with said knife for actuating said knife, and

lever means connecting said knife to said second fluid pressure means, said lever means causing said knife to travel in an arc and to cut said bag in a curved manner in an area adjacent an edge of said bag supported by said stop flap upon actuation of said knife.

4,627,782

GRAIN STORAGE AND TRANSPORTATION CONTAINER

Gordon C. Larson, 511 4th Ave. Southeast, Minneapolis, Minn. 55414

Continuation of Ser. No. 444,372, Nov. 26, 1982, abandoned. This application Nov. 30, 1984, Ser. No. 676,541
Int. Cl.[4] B60P *1/04*
U.S. Cl. 414—491 **4 Claims**

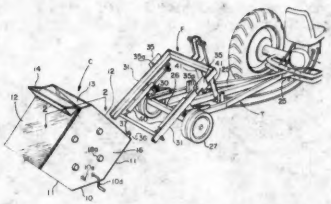
1. A storing and transporting container particularly adapted for use with grains and comprising,

a rigid container unit having a rigid wall portions defining a grain storage chamber therewithin and having a generally flat bottom portion with a discharge opening therethrough, said flat bottom providing a flat surface for supporting engagement with underlying supporting means,

openable flat hopper doors normally closing the discharge opening,

certain of said side wall portions sloping downwardly toward the bottom discharge opening to direct the grain to said opening during the discharging operation,

said container having a filler opening in the upper portion thereof with a removable cover normally closing said filler opening,



means for connecting the upper portions of the sloping side wall portions to a wheeled vehicle for transporting the same from one location to another, and

hollow perforated tube means extending across from one side wall to the other in fixed relation to both of said side walls and having sufficient strength to provide structural reinforcement to the container unit.

4,627,783

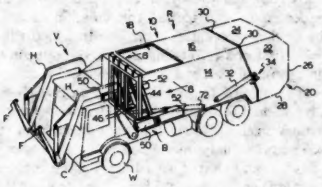
REFUSE DISPOSAL APPARATUS AND VEHICLE

Quinto De Filippi, 29 Edenvalley Drive, Islington, Ontario, Canada

Continuation-in-part of Ser. No. 440,719, Jan. 21, 1983, abandoned. This application Mar. 22, 1985, Ser. No. 714,881

Int. Cl.[4] B60P *1/00*

U.S. Cl. 414—517 **9 Claims**



1. A refuse compacting system comprising:

an elongated refuse container having a generally rectangular shape in cross-section, and defining a bottom wall, side walls and a top wall, and having an ejection opening at an ejection end thereof;

a movable door member movable between opening and closing positions for said ejection opening said door member having a generally horizontally directed power means with a lost motion connection that simultaneously moves and locks/unlocks the door member;

a refuse entry opening in said top wall at an entry end of said container;

a compactor assembly within said container, and being normally located at said entry end thereof remote from said ejection end, and having a dimension sufficient to substantially fill said rectangular cross-section of said container, and said compactor assembly including a generally angled blade member defining width and height dimensions substantially equal to the width and height of the interior of said refuse container, said blade member having a lower portion closer to said ejection opening and an upper portion more remote therefrom, and load bearing supporting means located on one side of said blade member, supporting and bracing the same at such angle;

power operated means including two pairs of dual parallel connected power cylinders, mounted side-by-side on opposite sides of said compactor assembly;

connection means extending between each said cylinder in a said pair, securing same together in parallel side-by-side relation for movement in unison;

a cylinder rod extending from each said cylinder in a said pair, a first said cylinder rod extending towards said entry end, and being fixed, a second said cylinder rod extending towards said ejection end and attached to said compactor assembly, operation of said cylinders procuring movement of said compactor assembly and both said cylinders in both said pairs simultaneously, while said first cylinder rods in both said pairs remain stationary for moving said compactor assembly from said entry end towards said ejection end and back again for compacting refuse and for ejecting refuse;

power cylinder housing means of elongated hollow shape having upper walls and side walls, and being closed at their forward ends and open at their rearward ends, said housing means being attached to said compactor assembly on either side thereof adjacent said lower portion of said blade member, and said housing means extending from said blade member on the side thereof remote from said load bearing supporting means and towards said ejection opening along each side of said refuse container, and,

guide rail means fastened within said refuse container on either side thereof, and extending substantially uninterrupted from one end to the other of said container, and engaging said upper walls of respective said power cylinder housing means, whereby to restrain tilting movement of said compactor assembly, during operation of said cylinders whereby said power cylinder housing means may move along substantially the full length of said container from one end to the other, said movement being guided by said guide means throughout the full extent thereof.

4,627,784

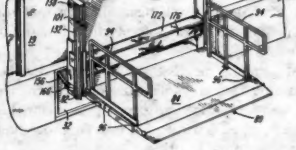
LOADING AND UNLOADING APPARATUS FOR A VEHICLE

Larry R. Collins, Cincinnati, Ohio, assignor to Venco Manufacturing, Inc., Cincinnati, Ohio

Filed Jan. 21, 1986, Ser. No. 821,060

Int. Cl.[4] B60P *1/44*

U.S. Cl. 414—540 **22 Claims**



1. Apparatus for loading articles onto the floor of a wheel-supported vehicle, said apparatus comprising a set of rigidly connected and parallel spaced elongated posts, means supporting said posts for longitudinal and tilting movement as a unit between a generally horizontal storage position under the floor of the vehicle and a generally vertical operating position adjacent a wall of the vehicle, an article support platform, elevator means mounted on said posts for longitudinal movement, means mounted on said elevator means and supporting said platform for pivotal movement between a retracted position

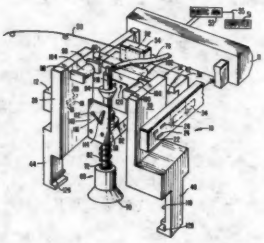
extending generally parallel to said posts and an extended position projecting outwardly generally perpendicular to said posts, power operated means for moving said elevator means and said platform longitudinally of said posts when said posts are in said vertical operating position and said platform is in said extended position to move said platform between a lower position and an elevated position, power operated means for moving said posts between said operating position and said storage position, and means for retaining said platform in said retracted position when said posts are in said storage position.

4,627,785

EXCHANGEABLE MULTI-FUNCTION END EFFECTOR TOOLS

Mathew L. Monforte, Hamilton, N.J., assignor to Monforte Robotics, Inc., Hamilton, N.J.

Filed May 14, 1984, Ser. No. 610,032
Int. Cl.[4] B25J *15/04*
U.S. Cl. 414—730 **3 Claims**



1. An exchangeable multiple function end effector tool suitable for use with a robotic end effector having a pair of extending fingers, including indexing means and locking means, disposed on the distal end of a robotic arm, comprising in combination:

(A) means for removably affixing said multiple function end effector tool to said pair of extending fingers;

(B) multiple function tool means having said tool affixing means disposed thereon, said multiple function tool means including;

(a) first gripping means for acquiring a first element and releasably retaining said first element in said multiple function tool, said first gripping means including,

(i) spring means for urging said first gripping means to its lowermost position,

(ii) collar means disposed on said first gripping means for limiting the travel of said first gripping means between its lowermost and uppermost positions, and

(iii) sensing means disposed proximate said first gripping means for providing an electrical signal when said first gripping means is in its uppermost and lowermost position; and

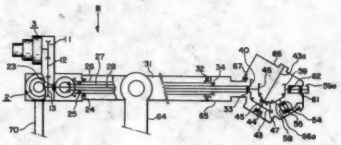
(b) second gripping means for acquiring a second element and releasably retaining said second element in said multiple function tool.

4,627,786

INDUSTRIAL ROBOT

Yoshihiko Minematsu; Minoru Tanaka; Kenichiro Sakamoto, and Masayuki Yamamoto, all of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 587,785
Claims priority, application Japan, Mar. 10, 1983, 58-41068; Mar. 10, 1983, 58-41069; Mar. 10, 1983, 58-41070; Mar. 10, 1983, 58-41072; Mar. 10, 1983, 58-41073; Nov. 18, 1983, 58-218218; Nov. 18, 1983, 58-218219
Int. Cl.[4] B25J *17/02*
U.S. Cl. 414—735 **10 Claims**



1. An industrial robot including a plurality of motors provided at an end of a hollow link, torque transmission means provided within said link for transmitting rotational torques of said plurality of motors, and rotary means for effecting a plurality of independent rotational motions in response to each of said motors, said rotary means being provided at the other end of said link and being drivingly connected to said torque transmission means, said rotary means comprising a first torque transmission means, said rotary means comprising a first rotary device having a first box (**65**) and rotating about an axis of said link, a second rotary device having a second box (**66**) and rotating about a rotary axis which obliquely intersects with a rotary axis of said first device, and a third rotary device having an output shaft and rotating about a rotary axis which intersects obliquely with the rotary axis of said second rotary device, said second rotary device including a first transmission shaft (**43***a*) one end portion of which is directly connected to said second box (**66**) and the other end portion of which is drivingly connected to said torque transmission means, said second rotary device substantially surrounding said third rotary device, said first box (**65**) being drivingly connected to a first drive shaft (**26**), said second rotary device further including a first bevel gear (**40**) coupled to a second drive shaft (**27**), and a second bevel gear (**43**) engaging said first bevel gear (**46**), said first transmission shaft (**43***a*) having at one end said second bevel gear (**43**) and obliquely intersecting with said rotary axis of said first device, and said third rotary device including a third bevel gear (**46**) coupled to a third rotary drive shaft (**28**), a fourth bevel gear (**47**) rotatable in coaxial relation with said first transmission shaft (**43***a*), a fifth bevel gear (**58**) engaging with said fourth bevel gear (**47**) and having a rotary axis which obliquely intersects with said rotary axis of said second rotary device, and a sixth bevel gear (**59**) engaging with said fifth bevel gear (**58**), said output shaft (**59***a*) being coupled to said sixth bevel gear.

4,627,787

CHIP SELECTION IN AUTOMATIC ASSEMBLY OF INTEGRATED CIRCUIT

Robert H. Bond, Carrollton; Steven Swendrowski, The Colony; Michael A. Olla, Flower Mound; Barry L. Morrison, Bedford; Ricky Parkinson, Lewisville; Linn Garrison, Garland, and John D. Pace, Irving, all of Tex., assignors to Thomson Components-Mostek Corporation, Carrollton, Tex.

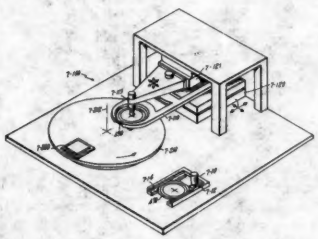
Filed Mar. 22, 1984, Ser. No. 592,156
Int. Cl.[4] B25J *9/00*
U.S. Cl. 414—786 **6 Claims**

1. A method of removing selected integrated-circuit dice from an array of non-contiguous dice adhesively attached to a support member having an upper striking side and a lower

adhesive side to which bottom sides of said dice are attached, said integrated circuit dice further having a contact side opposite said bottom side, said array of dice arranged so as to face down, comprising the steps of:

locating said support member at a predetermined location in space with said contact side of said array of dice facing in a predetermined direction;

striking said striking side of said support member at a contact point opposite a selected die of said array of dice with a predetermined impulse sufficient to dislodge said selected die from said support member, whereby said selected die is released from said adhesive attachment;



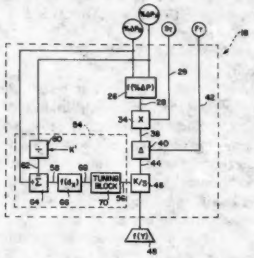
positioning a selected die receptacle at a predetermined distance below said selected die prior to striking, whereby said selected die falls away from said array into said receptacle, resting in said receptacle with said bottom side facing up; and repetitively executing said positioning and striking steps for a series of selected dice at a series of predetermined receptacle locations, said series of predetermined receptacle locations being and locations of a predetermined series of die receptacles positioned in space with a predetermined receptacle relationship, said support member being repetitively moved to locate a next selected die above a next receptacle so that a selected die is positioned at a striking location above a predetermined selected receptacle prior to striking.

4,627,788

ADAPTIVE GAIN COMPRESSOR SURGE CONTROL SYSTEM

Marion A. Keyes, IV, Chagrin Falls, and Jeremiah J. Shaffer, Euclid, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 20, 1984, Ser. No. 642,284
Int. Cl.[4] F04B *27/02*
U.S. Cl. 415—11 **3 Claims**



1. An adaptive gain surge control system for a centrifugal compressor having an associated surge line and a bypass line comprising:

a proportional and integral mode controller for controlling the bypass line of the compressor having a variable gain setting;

first means for determining the distance d between a surge control line and the compressor surge line;

second means for establishing a control signal in response to the distance d for changing the gain of said controller;

bypass valve control means connected to said controller for varying the amount of bypass across the compressor in response to the control signal therefrom; and

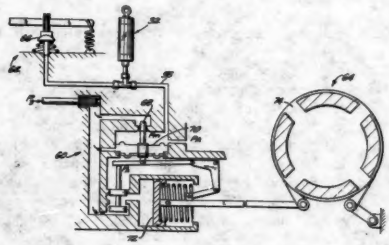
wherein said proportional and integral mode controller includes an antiwindup adjustment to adjust the integral mode of the controller to shift the proportional band of the proportional mode of the controller to the same side of the control line the measurement is on when the controller reaches it output limit to prevent overshoot thereby.

4,627,789

APPARATUS METHOD FOR CALIBRATING AND SETTING COMPRESSOR AIR BLEED VALVE SCHEDULES

David J. Petro, Milford, and Steven L. Battaini, Orange, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Sep. 19, 1984, Ser. No. 651,886
Int. Cl.[4] F01B *25/00*
U.S. Cl. 415—28 **8 Claims**



1. A calibration and testing apparatus for use with a gas turbine engine, said engine including a compressor having at least one compressor bleed valve and an air bleed actuator which is operative to open or close the bleed valve on the compressor, said apparatus comprising:

a float tube having opposed first and second ends, said first end of said float tube being in communication with said air bleed actuator;

an accumulator having a single aperture therein, said second end of said float tube being in communication with the accumulator at said single aperture; and

a float slidably disposed in said float tube, said float being dimensioned to permit controlled fluid communication between said air bleed actuator and said accumulator, said float being urged toward the first end of the float tube by a decrease in pressure in said air bleed actuator and being urged toward the second end of said float tube by an increase in pressure in said air bleed actuator, whereby said float will move from the first end of the tube to the second end thereof in response to pressure changes indicative of the initial opening of the bleed valve.

4,627,790

PORTABLE PUMP WITH AIR SEAL

H. David Bowes, and Edward S. Kuhn, both of Erie, Pa., assignors to Thompson-Chemtrex, Inc., Erie, Pa.

Filed Nov. 16, 1984, Ser. No. 672,371
Int. Cl.[4] F04D *29/10, 3/02*
U.S. Cl. 415—53 R **14 Claims**

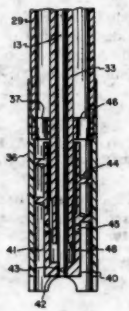
1. An axial flow liquid pump comprising:

an outer tube having an intake opening at one end for liquid to be pumped and an outlet opening near the opposite end;

an inner tube within the outer tube and means placing the interior of the inner tube in continuous communication with a supply of gas;

a driven shaft with one end journaled near the outlet end of the inner tube and the other end free;

a rotor having a sidewall, said rotor being secured on the free end of the shaft such that its sidewall is at least partially spaced between the inner tube and the outer tube;



said rotor having means to cause a pressure differential along the interior of the outer tube;

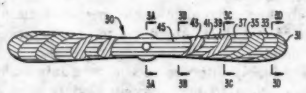
said rotor having at least one radial impeller passage in the sidewall, there being a first clearance between the inner surface of the inner tube and the shaft to permit a continuous flow of gas, there being a second clearance between the outer surface of the inner tube and the inner surface of the sidewall of the rotor, said radial impeller passages positioned such that gas and liquid are continuously drawn through the first and second clearances respectively and expelled through the passage.

4,627,791

AEROELASTICALLY RESPONSIVE COMPOSITE PROPELLER

Andrew C. Marshall, 2147 Wilmington Dr., Walnut Creek, Calif. 94596

Filed Nov. 10, 1982, Ser. No. 440,761
Int. Cl.[4] B64C *11/26, 11/34*
U.S. Cl. 416—132 R **10 Claims**



1. An improved propeller blade of the type having a leading edge, a trailing edge, a root, a tip and an axis extending from the root to the tip, the improvement comprising:

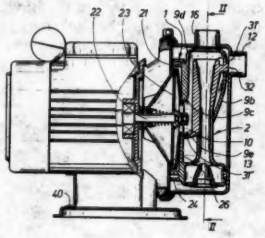
a laminate of a plurality plies of uniaxial fibers, said plies of uniaxial fibers oriented at varying angles to one another so the propeller blade pitch varies with the load on the propeller blade and with the axial position along the propeller blade, said plies of uniaxial fibers including a first set and a second set, said first set extending from said root to a position greater than about half way from said root to the tip, said second set extending from the root to the tip, the average axial orientation of said first set being radially outwardly and towards the leading edge of the propeller blade and the average axial orientation of said second set being radially outwardly and toward the trailing edge of the propeller blade so the blade exhibits increasing and then a decreasing pitch from the root to the tip.

4,627,792

ROTATING FLOW PUMP WITH A FEED PUMP UNIT FORMED AS AN EJECTOR

Niels D. Jensen, and Gunnar Langgaard, both of Bjerringbro, Denmark, assignors to Grundfos A/S, Bjerringbro, Denmark

Filed Sep. 12, 1985, Ser. No. 775,160
Int. Cl.[4] F04B *23/14*
U.S. Cl. 417—83 **10 Claims**



1. In an arrangement of a centrifugal pump and a feed pump unit formed as an ejector, centrifugal pump conprising an impeller rotatably mounted on a substantially horizontal shaft in a chamber defined by a casing, said chamber communicating with an inlet, and said ejector comprising an inlet portion, a nozzle, and a diffuser arranged in series in the flow direction and in a plane substantially perpendicular to said shaft, said diffuser having a channel means defining an inner channel which gradually increases in cross-sectional area along at least a portion of its length and a jacket means defining an annular channel which surrounds and is substantially coaxial with said inner channel, said inner channel having an outlet which communicates with a reversal chamber defined by an end wall of said jacket means, said reversal chamber further communicating with said annular channel for producing a substantially 180° reversal of the flow exiting said inner channel, said annular channel having an outlet which communicates with said inlet of said centrifugal pump, the improvement wherein said annular channel has a gradually increasing cross-sectional area in-the flow direction, said inlet portion and said inner channel form a U shape, and said inlet portion communicates with a suction pipe arranged above said inlet to said centrifugal pump.

4,627,793

MOTOR-DRIVEN RADIAL PLUNGER PUMP

Masatoshi Kuroyanagi, Kariya; Masahiko Suzuki; Yasuhiro Horiuchi, both of Aichi; Kazuma Matsui, Toyohashi; Kouichi Moriguchi, Nagoya, and Yukio Hashimoto, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 28, 1985, Ser. No. 738,649
Claims priority, application Japan, Jun. 13, 1984, 59-122799; Jun. 25, 1984, 59-131430
Int. Cl.[4] E04B *23/14;* F15B *21/04*
U.S. Cl. 417—203 **9 Claims**

1. A motor-driven radial plunger pump including:

an outer housing provided with fluid inlet and outlet;

a motor section including a motor housing so disposed in said outer housing as to cooperate therewith to define a fluid passage therebetween and an electric motor disposed in said motor housing;

said fluid inlet being communicated with said fluid passage;

a pump section including a pump housing disposed in said outer housing, a rotor disposed in said pump housing, a coupling member drivingly coupling said motor to said rotor, a plurality of radial cylinder bores in said rotor, plungers disposed in said cylinder bores for sliding movement therein, respectively, so that the radialiy inner ends of said plungers cooperate with associated cylinder bores to define variable volume chambers, a suction passage means communicated with said fluid passage and adapted

to be communicated with successive variable volume chambers when in suction strokes, and a discharge passage communicated with said fluid outlet in said outer housing and adapted to be communicated with successive variable volume chambers when in discharge strokes; and

a filter element disposed in said fluid passage upstream of said pump section.

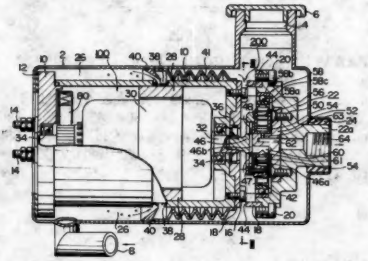
2. A motor-driven radial plunger pump including:

an outer housing provided with fluid inlet and outlet;

a motor section including a motor housing so disposed in said outer housing as to cooperate therewith to define a fluid passage therebetween and an electric motor disposed in said motor housing;

said fluid inlet being communicated with said fluid passage; and

a pump section including a pump housing disposed in said outer housing, a rotor disposed in said pump housing, a



coupling member drivingly coupling said motor to said rotor, a plurality of radial cylinder bores in said rotor, plungers disposed in said cylinder bores for sliding movement therein, respectively, so that the radially inner ends of said plungers cooperate with associated cylinder bores to define variable volume chambers, a suction passage means communicated with said fluid passage and adapted to be communicated with successive variable volume chambers when in suction strokes, and a discharge passage communicated with said fluid outlet in said outer housing and adapted to be communicated with successive variable volume chambers when in discharge strokes, said coupling member being so shaped as to provide feed holes disposed between said fluid passage and said suction passage and being rotatable with said rotor and said feed holes each being provided with means for positively feeding the working fluid from said fluid passage into said suction passage.

4,627,794

FLUID PRESSURE INTENSIFIER

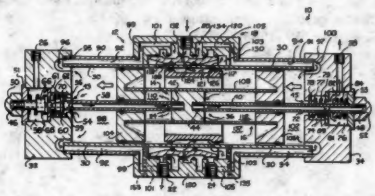
Ethan A. Silva, 410 McAuley, Oakland, Calif. 94609

Continuation-in-part of Ser. No. 454,062, Dec. 28, 1982, Pat. No. 4,523,895. This application May 24, 1985, Ser. No. 738,061

Int. Cl.[4] F04B *17/00*

U.S. Cl. 417—225 **13 Claims**

1. In fluid pressure intensifier including an elongated body, a reciprocating assembly located within the body adapted to be driven back and forth by a fluid, and a control mechanism for controlling the direction in which said reciprocating assembly is moving, an improved control mechanism comprising a valve housing surrounding said elongated body, a spool cylinder disposed within said valve housing and surrounding said elongated housing, and means responsive to the position of said reciprocating assembly and operative to direct a pilot pressure to said spool cylinder, said spool cylinder directing the flow of



an input fluid through passages provided in said body to move said reciprocating assembly in a desired direction.

4,627,795

PISTON ASSEMBLY FOR A COMPRESSOR OR THE LIKE

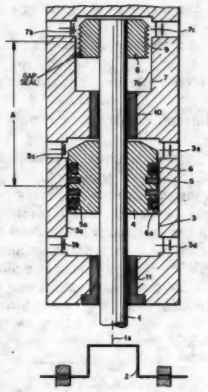
Hans-Helmut Schmitz-Montz, Cologne, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany and Atlas Copco Aktiebolag of Nacka, Stockholm, Sweden

Filed Mar. 29, 1983, Ser. No. 480,114

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211763

Int. Cl.[4] F04B *3/00, 39/00*

U.S. Cl. 417—267 **5 Claims**



1. A piston compressor comprising housing means including a plurality of axially spaced cylinders having respective cylindrical walls, and a piston assembly reciprocatable in said cylinders, said assembly comprising a piston rod and respective pistons secured to said rod in axially spaced relationship and each received in a respective one of said cylinders for compressing gas therein, guide piston means formed by at least one of said pistons constituted as a guide piston and being provided with piston and guide rings slidably engaging a wall of the respective cylinder, at least one other of said pistons being provided as a contactless piston maintaining a clearance with the wall of the respective cylinder, said guide piston means constituting the sole guiding means reciprocation of said assembly in said housing means, said rod being received with clearance over its entire length within said housing whereby said assembly is unsupported except by said guide piston means.

4,627,796

AIR REMOVING APPARATUS

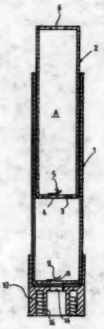
Gary R. Moore, 22 Magdalen Crescent, Napier, New Zealand

Filed Oct. 3, 1984, Ser. No. 657,263

Claims priority, application New Zealand, Nov. 16, 1983, 206298; Dec. 10, 1983, 205936

Int. Cl.[4] A47C *31/00;* **F04B** *39/12, 21/04*

U.S. Cl. 417—313 **2 Claims**



1. Apparatus for burping a waterbed having a filling and burping opening with a fitting therein for a removable cap for sealingly closing the opening, comprising:

an externally screw-threaded tubular shaped fitting connected with the opening;

a tubular hand operated vacuum pump having an inlet port at one end and an outlet at the other end for extracting air and/or liquid; and

a separate cap member attachable to said one end of said pump and sealingly engageable with said fitting comprising a base portion adjacent said one end of said pump,

a hole through said base portion aligned with said inlet port,

inner and outer substantially coaxial spaced sleeve elements to provide an annulus therebetween, and

an internal screw-thread on the inner surface of said outer sleeve element cooperatively and removably engageable with the external screw-thread on said fitting with the inner sleeve member inserted into said fitting,

so that the fitting is supported in said annulus and said inlet port communicates with said filling and burping opening when said vacuum pump is attached to the fitting and operation of said vacuum pump will extract air and/or liquid through the opening.

4,627,797

STANDBY AQUARIUM PUMP

Robert W. Rill, Jr., P.O. Box 20711, Sarasota, Fla. 33583-4711

Filed Oct. 15, 1985, Ser. No. 787,607

Int. Cl.[4] F04B *35/04, 17/00*

U.S. Cl. 417—411 **5 Claims**

1. A standby aquarium pump comprising:

housing means for containing the components of said aquarium pump;

an air pump;

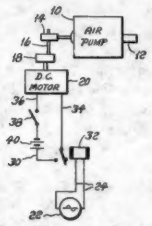
a direct current motor operatively connected to drive said air pump;

a direct current power supply;

a circuit between said direct current motor and said direct current power supply;

relay means having an alternating current input and being energized by alternating current; and

said relay means operatively connected in said circuit between said direct current motor and said direct current power supply for opening said circuit whenever alternating current power is available and for closing said circuit whenever said alternating current power is interrupted whereby said standby aquarium pump is operated when



alternating power is interrupted and will not operate when said alternating current is available;

4,627,798

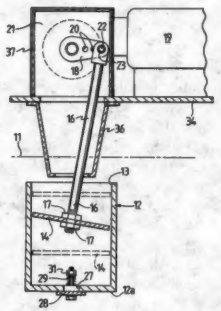
APPARATUS FOR CIRCULATING CLEANING FLUID THROUGH A COOLING SYSTEM

Dalton A. Thomas, Rte. 1, Box 97, Alpine, Ala. 35014

Continuation-in-part of Ser. No. 804,765, Dec. 5, 1985, abandoned. This application Apr. 24, 1986, Ser. No. 858,561

Int. Cl.[4] F04B *35/04, 21/00;* **B08B** *9/00*

U.S. Cl. 417—415 **13 Claims**



1. Apparatus for circulating cleaning fluids from a reservoir thereof through a cooling system submerged in said reservoir comprising:

(a) a cylinder having an open top and a closed bottom mounted within said reservoir with said open top submerged within said cleaning fluid, with said cylinder having an intake port operable connected to said cooling system, and a discharge port communicating with said reservoir;

(b) valve means for opening said discharge port responsive to an increase in pressure within said cylinder and closing said discharge port responsive to decrease in pressure within said cylinder;

(c) a thin washer-like member mounted within said cylinder for reciprocating motion therewithin, with said washer-like member having a predetermined annular clearance from the interior of said cylinder;

(d) drive means mounted externally of said reservoir for imparting reciprocatory motion to said washer-like member within said cylinder; and

(e) means for covering said reservoir including an elongated sleeve-like splash guard extending concentrically above said cylinder and adapted to retain heat and fluids within said reservoir.

4,627,799

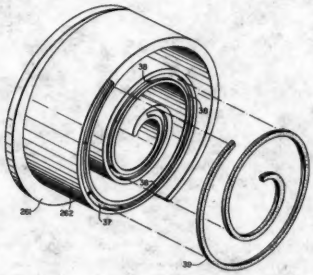
AXIAL SEALING MECHANISM FOR A SCROLL TYPE FLUID DISPLACEMENT APPARATUS

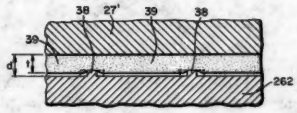
Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Japan

Continuation of Ser. No. 644,378, Aug. 27, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 843,929

Int. Cl.[4] F01C *1/04, 19/08*

U.S. Cl. 418—55 1 Claim





1. In a scroll type fluid displacement apparatus including a pair of scrolls each having an end plate and a spiral wrap extending from one side of said end plate, said spiral wrap having a groove formed in its axial end surface along the spiral curve, said spiral wraps interfitting at an angular and radial offset to make a plurality of line contacts which define at least one pair of fluid pockets, a driving mechanism operatively connected to one of said scrolls to orbit said one scroll relative to the other scroll while preventing rotation of said one scroll to thereby change the volume of the fluid pockets, the improvement comprising a plurality of non-resilient projections integrally formed with and immovably fixed to the bottom surface of said groove at a predetermined spacing, said projections engaging and fixed to inner and outer circumferential walls of said groove so that said projections extend completely across said groove, a resilient seal element disposed on said projections along said groove, said seal element having a thickness greater than the depth of said groove minus the depth of said projections so that said seal element partly extends from said groove to contact and be compressed by the opposing circular end plate along its entire length to thereby axially seal the fluid pockets.

4,627,800

SCROLL TYPE FLUID DISPLACEMENT COMPRESSOR WITH SPIRAL WRAP ELEMENTS OF VARYING THICKNESS

Yasuyuki Matsudaira, Isesaki, and Masaharu Hiraga, Honjo, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Feb. 4, 1985, Ser. No. 697,747

Int. Cl.[4] F04C *18/04*

U.S. Cl. 418—55 2 Claims

1. In a scroll type fluid displacement compressor including a housing having a fluid inlet port and fluid outlet port, a fixed scroll fixedly disposed within said housing and having a circular end plate from which a first wrap extends, an orbiting scroll having a circular end plate from which a second wrap extends, said first and second wraps interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, a driving mechanism operatively connected to said orbiting scroll to effect the orbital motion of said orbiting scroll and a rotation prevention device to prevent the rotation of said orbiting scroll during orbital motion so that the volume of the fluid pockets changes, the improvement comprising said second wrap of said orbiting scroll having a thickness which is gradually reduced along its entire length from the inner end portion to the outer end portion thereof to strengthen the inner portion of said second wrap without increasing the centrifugal force generated by said orbiting scroll during its orbital motion, an inner wall surface and outer wall surface of said second wrap being formed by involute curves generated from generating circles having different radii, and said first wrap of said fixed scroll having a thickness which is gradually increased along its entire length from the inner end portion of the outer end portion to compensate for the reduction in thickness of said second wrap to thereby achieve proper line contacts between said first and second wraps to improve radial sealing.

4,627,801

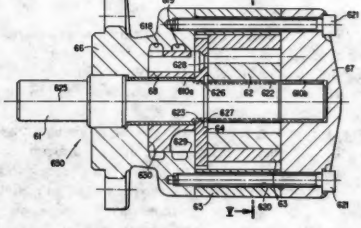
ROTARY GEAR MACHINE WITH COMMUTATOR AND SHAFT IN FLANGE HOUSING

Peter Wüsthof; Johann Schneider, both of Lohr, and Ewald Schulz, Neuhuetten, all of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 562,745, Dec. 19, 1983. This application Dec. 24, 1984, Ser. No. 686,309

Int. Cl.[4] F01C *1/113;* F03C *2/08*

U.S. Cl. 418—61 B 6 Claims



1. A rotary piston machine comprising:

a housing;

flange housing means on said housing for mounting the machine on suitable support means;

a shaft rotatably supported within said housing;

a rotor fixedly mounted on said shaft and adapted to rotate together with said shaft;

a hollow gear for forming compressing chambers in cooperation with said rotor;

a commutator fixedly mounted within said housing and adapted to supply pressure medium to, and to remove pressure medium from, said compressing chambers;

wherein said shaft extends out of said flange housing means and said commutator is located in said flange housing means and is fixedly mounted therein against rotation, wherein the commutator has a flat side and is press-fit into an axial bore of said flange housing means and sealingly abuts with the flat side against the bottom of the bore; a control disc arranged between the commutator and the rotor, and a safety element provided between the control disc and the rotor, said safety element being fixedly secured with respect to displacement in the axial direction of said shaft, said safety element being located in relief means of said control disc, and wherein said safety element further abuts at a face of the rotor which faces towards said flange housing means.

4,627,802

ROTARY VANE COMPRESSOR WITH INLET AND OUTLET VALVES IN THE ROTOR

Rudolph Draaisma, and Werner Reichmann, both of Öresundsgatan 30, S-252 28 Helsingborg, Sweden

PCT No. PCT/SE84/00133, § 371 Date Dec. 11, 1984, § 102(e) Date Dec. 11, 1984, PCT Pub. No. WO84/04137, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 12, 1984, Ser. No. 681,850

Claims priority, application Sweden, Apr. 12, 1983, 8302006

Int. Cl.[4] F04C *18/00, 23/00, 29/08*; F16K *31/12*

U.S. Cl. 418—185 **5 Claims**

1. A vane compressor comprising a rotor eccentrically arranged in a cylindric housing and vanes located in the rotor and defining spaces between the periphery of the rotor and the inner surface of the housing, the volume of each of said space varyng during the rotation of the rotor,

said rotor comprising at least two inlet valves, each located in the rotor between an inlet of the compressor and one of said spaces, and at least two outlet valves each located in the rotor between one of said spaces and an outlet of the compressor and adapted to open when the pressure in said space exceeds the counterpressure at the outlet during the compression stroke,

said inlet valves being adapted to open when the pressure in said space is below the pressure of the inlet in order to suck in air inside said space during the intake stroke of the rotor; and

said inlet valves and outlet valves being physically interconnected in such a way that the inlet valve at one side of the rotor is opened substantially at the same time as the outlet valve at the diametrically opposite side of the rotor.

4,627,803

APPARATUS FOR PRODUCING POLYACETYLENE FILM

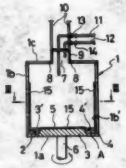
Junichi Umetsu, No. 3-17, Kikusui 5-jo 2-chome, Shiroishi-ku, Sapporo, Japan

Filed Aug. 31, 1984, Ser. No. 646,228

Claims priority, application Japan, Aug. 31, 1983, 58-134886[U]; Sep. 12, 1983, 58-141186[U]

Int. Cl.[4] C08F *4/00*

U.S. Cl. 425—6 **11 Claims**



1. An apparatus for the catalytic film polymerization of a gaseous monomer, comprising:

(a) a polymerization vessel having an interior surface defining a sidewall portion and a bottom portion;

(b) means for retaining a quantity of liquid catalyst in said bottom portion along a perimeter area of said bottom portion;

(c) a raised portion projecting from a central area of said bottom portion and having an upper surface extending from a liquid surface of said liquid catalyst;

(d) means for feeding a monomer gas to said vessel;

(e) means for coating said catalyst along said interior surface and said upper surface of said raised portion, forming thereby a catalyst film, said monomer gas being polymerized in the presence of said catalyst to produce a polymer film of uniform thickness along said interior surface and said upper surface of said raised portion.

4,627,804

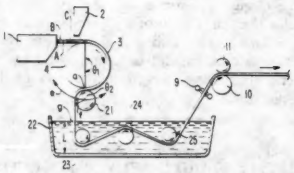
SHEET FORMING APPARATUS

Yoshio Kobayashi; Kuniharu Tobita, and Kazuo Kishimoto, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 640,598, Aug. 14, 1984, abandoned. This application Mar. 14, 1986, Ser. No. 840,478

Int. Cl.[4] B29B *7/82*

U.S. Cl. 425—71 **2 Claims**



1. An apparatus for forming double-side polished sheet of thermoplastic resin, comprising:

a first cooling roll;

means for forming a sheet of thermoplastic synthetic resin on said first cooling roll along a contact angle Θ_1;

a second cooling roll having a smaller diameter than said first cooling roll and mounted adjacent said first cooling roll for engaging the outer surface of the sheet formed on said first cooling roll and nipping the sheet between said cooling rolls for receiving the sheet from said first cooling roll onto a part of the surface thereof along a contact angle Θ_2;

mounting means on which said second cooling roll is mounted for being movable along the outer circumference of said first cooling roll for varying said contact angles while continuing to nip the sheet between said cooling rolls;

a water tank having at least one guide roller therein and positioned for receiving the sheet directly from said second cooling roll and guiding the sheet from said second cooling roll directly into said water tank; and

means for varying the water level in said water tank in accordance with said contact angles for making the distance from the point at which the sheet leaves said second cooling roll to the water level is such that the surfae temperature of the sheet is below the melting point of the resin when the sheet reaches the water.

4,627,805

VERTICAL FOIL-BLOWING HEAD

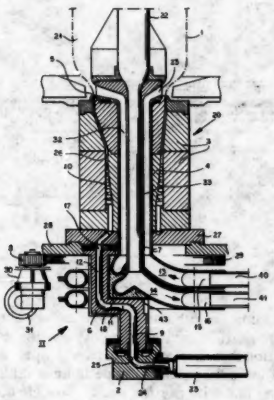
Willi Schnell, Cologne, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co., Troisdorf, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,608

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1983, 3331832

Int. Cl.[4] B29C *47/24*

U.S. Cl. 425—72 R 6 Claims



1. A vertical foil-blowing head comprising:

a stationary lower part disposed along a vertical axis, connected with a source of a thermoplastic melt, said stationary lower part further having a vertical axial outlet for said melt;

a foil-blowing rotatable die disposed above said stationary part along said axis and comprising a rotatable ring member and a rotatable core member defining a flow passage for said melt terminating in an annular mouth from which said melt engages to be blown into a foil tube;

means for retaining said die about said axis;

rotatable ducts extending through said rotatable core member along said axis and communicating with said foil tube for introducing blowing and cooling air into said foil tube and discharging said air therefrom;

a rotatable distributor connecting said stationary part with said rotatable die, said rotatable distributor being provided with a distributor passage connected with said outlet, said rotatable distributor having a substantially horizontal portion extending outwardly beyond said rotatable ducts, and a substantially vertical portion connected to said substantially horizontal portion and opening into said flow passage at a single non-annular inlet orifice disposed outwardly of said ducts and offset from said axis; and

wherein said rotatable ducts are provided with radial branches extending away from said rotatable distributor and communicating with annular channels for said air, said rotatable ducts being separated from said rotatable distributor by an insulating free space filled either with air or a thermal insulation material.

4,627,806

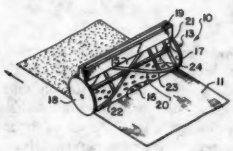
APPARATUS FOR THE MANUFACTURE OF FIBROUS WEBS WITH HELICAL ROTOR

Jeffrey J. Johnson, Menasha, Wis., assignor to James River-Norwalk, Inc., Norwalk, Conn.

Filed Aug. 30, 1985, Ser. No. 770,949

Int. Cl.[4] B28B *5/00*

U.S. Cl. 425—83.1 6 Claims



1. An apparatus for depositing a uniform web of dry fibers on a moving forming wire, comprising:

a fiber distributor housing having upper and lower wall sections of generally semi-cylindrical shape and end walls extending transversely thereof, said walls being cooperatively disposed to define a generally cylindrical chamber having its axis of curvature extending transversely of the direction of movement of said wire,

said lower wall section comprising means defining a screen disposed above said forming wire for accommodating passage of fiber therethrough:

means defining an elongate opening in said upper wall and extending in the direction of its axis of curvature for introducing air-entrained dry fibers into said chamber; and

a rotor having an axis of rotation substantially coextensive with the axis of curvature said chamber,

said rotor including a plurality of substantially equally angularly spaced helical rotor blades, said rotor blades being spaced equidistant from the axis of rotation and extending between said end walls in close proximity to said lower and upper wall sections,

whereby upon rotation of said rotor, air-entrained fibers introduced into said chamber through said opening are caused by said helical rotor blades to move axially of said chamber, uniformly to distribute said fibers in cross machine direction, while said fibers are being moved radially outwardly of said rotor for passage through said screen.

4,627,807

APPARATUS FOR MANUFACTURING SLIDE FASTENER WITH SEPARABLE END STOP

Kazuki Kuse, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Apr. 5, 1985, Ser. No. 720,419

Claims priority, application Japan, May 10, 1984, 59-93278

Int. Cl.[4] B29D *5/02*

U.S. Cl. 425—116 3 Claims

1. In an apparatus for manufacturing a slide fastener with a separable end stop, including:

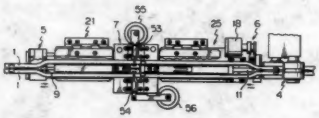
a conveyor device for conveying engaged stringers of continuous length which have space portions disposed at intervals in their longitudinal directions;

a stringer separating device for separating said engaged stringers as they are moved, and a stringer recombining device for re-engaging the separated stringers;

an injection molding station for molding upper stops and pins which constitute a separable end stop at both ends, respectively, of each of said space portions, said station being provided between said stringer separating and recombining devices; and

a positioning device which suspends said conveyor device when sensing one of said space portions in such a manner that the sensed spaced portion is stopped at said injection molding station,

an improvement characterized by comprising:



a device for independently bending a portion of a tape which constitutes each of said stringers at said space portion within said injection molding station; and

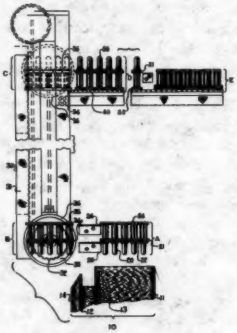
stoppers provided such as to be immovable relative to said injection molding station in terms of the moving direction of said stringers, said stoppers respectively engaging with end fastener elements at the opposite ends of said space portion while said bending operation is being effected, thereby positioning said fastener elements.

4,627,808

APPARATUS FOR MAKING CAPSULE HAVING PLURAL CHAMBERS

Raymond J. Hughes, P.O. Box 801, Mantoloking, N.J. 08738

Filed May 31, 1985, Ser. No. 739,624
Int. Cl.[4] B29C *41/02, 41/14, 41/40*
U.S. Cl. 425—270 **7 Claims**



1. A multiple chamber hard capsule making apparatus, comprising cleft dipping pins connected to mounting bars, and stripping rings connected by slide rods to said mounting bars for ejecting capsules from said pins.

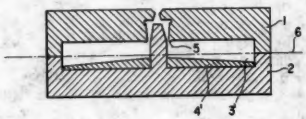
4,627,809

METAL MOLD AND STAMPER FOR INJECTION MOLDING OF A PLASTIC DISC FOR A HIGH-DENSITY INFORMATION RECORDING CARRIER

Norio Okabayashi, Himeji, and Yoshio Onizawa, Hyogo, both of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 21, 1984, Ser. No. 642,905
Claims priority, application Japan, Sep. 22, 1983, 58-174173
Int. Cl.[4] B29C *45/37*
U.S. Cl. 425—555 **9 Claims**

1. In a metal mold to be used for injection-molding a flat plastic disc having uniform thickness for a high-density information recording carrier by injecting molten resin into a flat and annular mold cavity, the improvement characterized in that an axial thickness of the flat and annular injection mold cavity is substantially continuously increased away from a gate



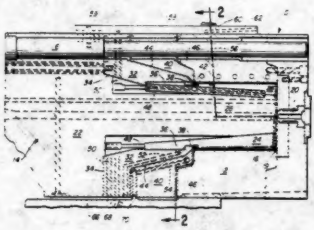
at the center of the molding cavity outwardly from the gate to the mold cavity perimeter for injecting the molten resin into the center of the mold and forming a flat resin disc having uniform thickness when molten resin is injection molded in said cavity.

4,627,810

COLLAPSIBLE CORE

John W. Von Holdt, 6864 Lexington La., Niles, Ill. 60648

Filed Sep. 26, 1985, Ser. No. 781,131
Int. Cl.[4] B29C *33/02*
U.S. Cl. 425—577 **27 Claims**



1. In an injection mold having a mold cavity portion and a collapsible core portion, said mold cavity portion and collapsible core portion being movable between open and closed positions, and including means for defining a mold chamber between said mold cavity portion and collapsible core portion in the closed position, plus aperture means permitting filling of the mold chamber with molding compound, said core portion defining a core base, and outer core members longitudinally movable along said core base between a molding position and a collapsed position, the improvement comprising, in combination:

said collapsible core portion also including a first mold ring positioned about said core base, said first mold ring being longitudinally movable to define a first, annular parting line between said core base and first mold ring, said first mold ring carrying said outer core members to control the longitudinal positioning of said outer core members while permitting said outer core members to move radially inwardly and outwardly between molding and collapsed positions; a second mold ring carried on said collapsible core portion, said second mold ring including stripper ring means, said second mold ring being longitudinally movable to define a second, annular parting line with said first mold ring, said second mold ring also forming a third, annular parting line with the mold cavity portion; means for relatively moving said core base, mold cavity portion, and first and second mold rings in a longitudinal direction relative to each other; and locking means for locking at least said third parting line closed in the molding position and to sequentially open said parting lines, whereby, as the mold moves from the closed position to the open position,

the first parting line, the third parting line, and then the second parting line are sequentially opened, and means to cause said outer core members to move to a collapsed position as the first parting line opens, and to cause said outer core members to move again outwardly to a molding position as the first parting line closes.

14. In an injection mold having a mold cavity portion and a collapsible core portion, said mold cavity portion and collapsible core portion being longitudinally movable between open and closed positions, and including means for defining a mold chamber between said mold cavity portion and collapsible core portion in the closed position, plus aperture means permitting filling of the mold chamber with molding compound, said core portion defining a core base having tapered side portions, and outer core members longitudinally movable along said core base between a molding position and a collapsed position, and the improvement comprising, in combination:

said collapsible core portion also including a first mold ring positioned about said core base, said first mold ring being longitudinally movable to define a first, annular parting line between said core base and first mold ring, said first mold ring carrying said outer core members to control the longitudinal position of said outer core members, but permitting said outer core members to move radially inwardly and outwardly between molding and collapsed positions while moving along said tapered core base; a second mold ring carried on said collapsible core portion, said second mold ring including stripper ring means, said second mold ring being longitudinally movable to define a second, annular parting line with said first mold ring, said second mold ring also forming a third, annular parting line with the mold cavity portion; first rack means carried by said core base; second rack means carried by said mold cavity portion; and pinion means carried by said second mold ring, said first and second rack means and pinion means being positioned so that the pinion means is placed between the first and second rack means, said pinion means simultaneously rolling against both of said first and second rack means; means for longitudinally moving said first mold ring; and means to sequentially open said first, second, and third annular parting lines, whereby, as the mold moves from the closed position to the open position, the first parting line, the third parting line, and then the second parting line are sequentially opened; and means to cause the outer mold members to collapse inwardly to the collapsed positioned as the first parting line opens and to cause said outer core members to move again outwardly into a molding position as the first parting line closes.

27. In a mold having more than two movable separable portions said movable, separable portions defining a plurality of parting lines, the improvement comprising, in combination:

a longitudinally positioned bar pivotally attached to one of said movable, separable portions; first cam means carried on at least one other of said movable, separable portions said cam means being positioned to engage and hold said bar in a first predetermined angular position; latch member means carried on said bar and latch sites carried on two of said other separable portions, said latch member means and latch sites being positioned to lock together to prevent separation of two of said separable portions while the bar is in the first predetermined angular position, to lock at least one of the parting lines, and second means for causing said bar to pivot to another angular position, as the movable, separable portions move to another predetermined position, in which the latch member means and latch sites can separate, whereby said one parting line can be automatically opened later than at least one other parting line by moving said movable, separable portions.

4,627,811

APPARATUS FOR PRODUCING A SPUNBOND

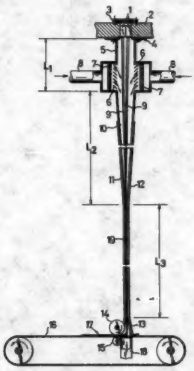
Wolfgang Greiser, Neusäss, and Hans Wagner, Bobingen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 17, 1985, Ser. No. 692,305

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401639

Int. Cl.⁴ B29C *47/14, 47/88*

U.S. Cl. 425—72 S **5 Claims**



1. In an apparatus for producing a spunbond by pneumatic take-off and laying of melt-spun filaments including a superatomospheric pressure chamber connected to melt spinneret in a gas-tight manner and having discharge orifices for the filaments, the improvement according to which the superatomspheric pressure chamber has a gradual tapering portion merging into a drawing cell, air supply means connected to supply the superatomspheric pressure chamber with air through two opposite rows of air supply means arranged at some distance from the spinnerets, and deflection means disposed to deflect air flow from the supply means in the direction of filament movement.

4,627,812

FLUIDIZED BED COMBUSTOR

Felix T. Kelly, Bagshot; David C. Newey, Byfleet, and Gordon W. Sutton, Bisley, all of England, assignors to The British Petroleum Company p.l.c., London, England

Continuation of Ser. No. 661,268, Oct. 16, 1984, abandoned, which is a continuation of Ser. No. 384,925, Jun. 4, 1982, abandoned. This application Mar. 3, 1986, Ser. No. 835,430

Claims priority, application United Kingdom, Jun. 11, 1981, 17964

Int. Cl.⁴ F23D *11/00*

U.S. Cl. 431—7 **10 Claims**

1. A method of starting up a fluidized bed combustor comprising the steps of:

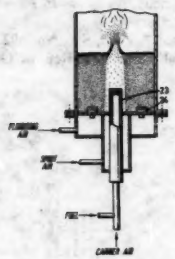
(a) passing an oxygen containing gas from an outlet beneath the surface of a slumped bed of particulate material to cause a spout zone of particulate material above the surface of the slumped bed;

(b) introducing liquid fuel from a nozzle within the bed into the effective spouting zone of the bed whereby a mixture of liquid fuel and oxygen containing gas is rapidly transported through the bed to the upper surface of the bed;

(c) igniting the liquid fuel/oxygen containing gas mixture above the surface of the bed;

(d) after ignition passing an oxygen containing gas into the bed to thereby obtain a controlled rise in the temperature of the bed until the entire bed is fluidized; and

(e) decreasing the flow of oxygen containing gas causing the spout simultaneously with said controlled temperature



rise and stopping the flow of oxygen containing gas causing the spout when the entire bed is fluidized.

4,627,813

THERMAL FIXING APPARATUS

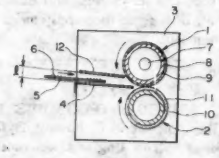
Yoshitaka Sasaki, Saitama, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed May 25, 1984, Ser. No. 614,192

Claims priority, application Japan, May 25, 1983, 58-91974; May 25, 1983, 58-91975

Int. Cl.[4] G03G *15/20*

U.S. Cl. 432—60 **3 Claims**



1. A thermal fixing apparatus for a sheet bearing a tonr image comprising: a pair of rolls in contact with one another forming a nip therebetween, at least one of said rolls being heated, the other of said rolls being covered with an elastically deformable outer layer; and

a plate-like form of heater element having a width corresponding substantially to an axial length of said pair of rolls, and disposed substantially parallel to the passage of image-bearing sheet conveyed into a said nip, wherein an edge of said heater element being located adjacent to the surface of one of said rolls;

wherein said heater element elevates the temperatures of a sheet carrying a toner image so as to make said toner semimolten and said pair of rolls elevates said sheet temperature further to fix said toner image and the surface temperature of said heated roll along its axial length is less at its ends than at its central portion and said surface temperature of said heater element is greater at end portions thereof, adjacent ends of said rolls, than at a central portion of said heater element, whereby the toner image will be melted uniformly.

4,627,814

CONTINUOUS TYPE ATMOSPHERE HEAT TREATING FURNACE

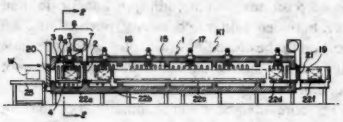
Fumihiko Hattori, Izumi, and Yoshikazu Shimosato, Yahata, both of Japan, assignors to Chugai Ro Co., Ltd., Osaka, Japan

Filed Jul. 16, 1985, Ser. No. 755,939

Claims priority, application Japan, Jul. 17, 1984, 59-149130

Int. Cl.[4] F27B *9/02, 5/04, 5/14;* F27D *7/04*

U.S. Cl. 432—128 **8 Claims**



1. A continuous heat treating furnace for heat treating a ferrous metal work in a combustible protective atmosphere, said furnace being lined with refractories and comprising:

a charge door which is provided at one end of said furnace;

a discharge door which is provided at the other end of said furnace;

a partition door for separating said furnace into a charge chamber and a heat treating chamber;

a heating means for heating said work in said charge chamber and said heat treating chamber;

a transport means for transporting said work in said charge chamber and said heat treating chamber;

a recirculating fan for transferring convectional heat to said work;

a gas purge means for purging said charge chamber;

a combustion means for burning, into burnt exhaust gas, combustible exhaust gas generated by burning an atmosphere in said charge chamber so as to supply the potential heat of the burnt exhaust gas, as radiant heat, to said charge chamber;

said recirculating fan, said purge means and said combustion means being provided in said charge chamber; and

an agitating means for agitating the combustible protective atmosphere supplied into said heat treating chamber, which is provided in said heat treating chamber, whereby said work is preheated in said charge chamber to a temperature enabling sufficient vaporization of such impurities as oil on said work and then, is subjected to a predetermined heat treatment in said heat treating chamber.

4,627,815

CERAMIC TEMPERATURE STABILIZATION BODY, AND METHOD OF MAKING SAME

Fritz Aldinger, Rodenbach, and Waltraud Werdecker, Hanau, both of Fed. Rep. of Germany, assignors to W.C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 660,499

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1983, 3337630

Int. Cl.[4] F27D *7/00*

U.S. Cl. 432—24 **14 Claims**

1. Method of equalizing temperature within a confined area, where the temperature is above 1000° C., comprising the step of

surrounding at least a portion of the confined area with a ceramic stabilization body,

said temperature stabilization body comprising

a densely sintered mixture of

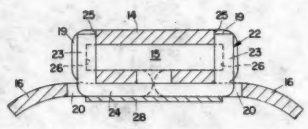
(a) powdered aluminum nitride;

(b) a first additive of from 0.05% to 2% of aluminum powder, having a grain size under 1 micrometer, and

(c) a second additive of from 0.1% to 10%, comprising at least one of the materials of the group consisting of: an oxide of an alkaline earth; an oxide of a rare earth metal;

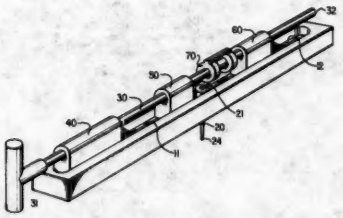
an oxide of a transition metal of the IVth, Vth, and VI groups of the periodic system; and silicon dioxide,
said second additive being present in powder form,
said body having been first cold-pressed and then densely sintered at a temperature of between 1700° C. to 2000° C.,
all percentages being by weight and with reference to the aluminum nitride.

4,627,816
ORTHODONTIC APPARATUS
Hans Günzel, Dachauerstr. 65, 8037 Neuesting, Fed. Rep. of Germany
Filed May 16, 1985, Ser. No. 735,225
Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419348
Int. Cl.⁴ A01C *7/00*
U.S. Cl. 433—11 **9 Claims**



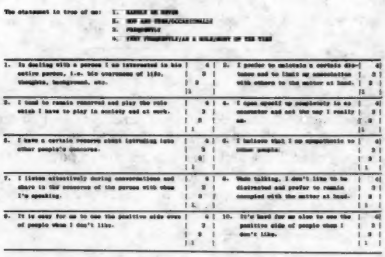
1. Orthodontic arch apparatus comprising
a lock adapted for attachment to a tooth having a passage therethrough with a least one aperture formed in a side wall of said passage;
spring means adapted for attachment to said lock, a portion of said spring means extending through said aperture and into said passage;
a latch adapted for bearing an orthodontic arch wire, said latch being receivable in said passage and having at least one recess adapted for locking engagement with said portion of said spring means.

4,627,817
DENTAL BRIDGE REMOVER
Jack Higa, 925 Esquimalt, West Vancouver, British Columbia, Canada V7T 1J8
Filed Mar. 14, 1985, Ser. No. 711,987
Claims priority, application Canada, Mar. 20, 1984, 449953
Int. Cl.⁴ A61C *3/00*
U.S. Cl. 433—152 **32 Claims**



1. An instrument for removing dental bridgework, comprising:
(a) a support beam having sufficient longitudinal extension to extend into a patient's mouth over bridgework bonded therein;
(b) a bracing pin having a upper end mounted to said beam, said bracing pin for holding said beam at said upper end mount at a fixed position away from said bridgework during removal of said bridgework; and,
(c) pulling means comprises an elongated rotatable shaft supported by said beam for rotatably engaging and drawing a pulling cord looped beneath said bridgework in an occlusal direction towards said beam to break said bond when said beam is braced by said pin.

4,627,818
PSYCHOTECHNOLOGICAL TESTING METHOD AND DEVICE THEREFOR
Jost Von Fellenberg, Auf der Bürglen 27, 8627 Grüningen, Switzerland
Filed Aug. 26, 1985. Ser. No. 769,558
Claims priority, application Switzerland, Aug. 28, 1984, 4124/84-5
Int. Cl.⁴ G09B *19/00*
U.S. Cl. 434—236 **14 Claims**



1. A psychotechnological method for detecting the disposition of a human test subject toward a selected trait, said method comprising:
(a) formulating and presenting to the test subject a plurality of sets of statements, each set containing first and second groups which respectively include first and second complementary statements, and a preselected choice of at least three responses for each statement, the test subject selecting one of the responses in answer to each statement, each response being assigned a respective predetermined weighting factor which determines a response value which is assigned to each response;
(b) adding the response values which correspond to the responses selected by the test subject on a group by group basis to derive for each group a group test score;
(c) plotting the group test scores of each one of the groups that is associated with the first complementary statements on a respective axis of an indexed polar coordinate system having at least as many axes as said number of sets of statements;
(d) plotting the group test scores of each one of the groups that are associated with the second complementary statements on a respective axis of a second indexed polar coordinate system having at least as many axes as as said number of sets of statements; and
(e) comparing and evaluating the plotted response values which appear on the first and second coordinate systems to determine the characteristic or disposition of the test subject.

4,627,819
TEACHING OR AMUSEMENT APPARATUS
Roger I. Burrows, Manhattan Beach, Calif., assignor to Price/-Stern/Sloan Publishers, Inc., Los Angeles, Calif.
Continuation-in-part of Ser. No. 697,973, Jan. 23, 1985, abandoned, which is a continuation of Ser. No. 478,680, Mar. 25, 1983, abandoned. This application Oct. 31, 1985, Ser. No. 793,705
Int. Cl.⁴ G09B *5/06*
U.S. Cl. 434—337 **8 Claims**

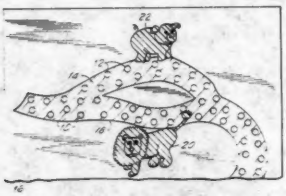
4. In an apparatus incorporating an infrared reflective substrate having first selected areas printed in infrared absorptive

carbon black ink and second selected areas printed in infrared transparent ink, the improvement comprising:

said first areas comprising bars of a bar code, said bars each being printed in a determined screen of carbon black ink dots;

said second areas comprising spaces between said bars of said bar code and each being printed in a screen corresponding with said determined screen in said first areas, but in infrared transparent simulated black ink dots;

whereby said bars and said spaces are rendered visually indistinguishable from each other, but are readily distinguishable from each other by an infrared emitting and reflectance measuring device.



4,627,820

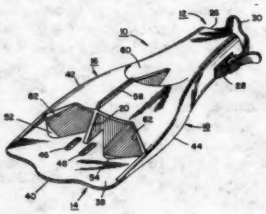
SWIM FIN

Larry M. Penebre, 138 Haseco Ave., Port Chester, N.Y. 10573

Filed Jun. 18, 1985, Ser. No. 745,911

Int. Cl.[4] A63B *31/08*

U.S. Cl. 441—64 **20 Claims**



1. A swim fin comprising a foot portion, an essentially horizontal flipper and shell means coupling said foot portion and said flipper and defining channel means between said shell means on one side and, on the other side, said flipper and said foot portion, said channel means initiating at water inlet aperture means and terminating at water outlet aperture means and with said flipper extending across and outboardly of said channel means and said water outlet aperture means.

4,627,821

HELICOPTER RESCUE DEVICE

James Bradley, Delta; George E. Evans, West Vancouver; Donald Mackenzie, Delta, and Michael Marcuson, Burnaby, all of Canada, assignors to Empra Systems Corp., Richmond, Canada

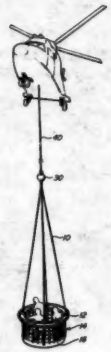
Filed Jun. 19, 1984, Ser. No. 622,270

Claims priority, application Canada, Sep. 2, 1983, 436049

Int. Cl.[4] B64D *47/00*

U.S. Cl. 441—83 **4 Claims**

1. A device which provides buoyant support for persons in water and is suitable for lifting by a helicopter comprising a buoyant floatation ring large enough to surround several standing persons, a rigid, non-buoyant substantially flat apertured deck for supporting said persons when standing on the deck, collapsible netting connecting said ring and said deck and fully surrounding the deck area, the floatation ring having sufficient buoyancy to support the whole device and deck in the water with the deck suspended below water level; and supporting cable means for suspending said device with several persons therein from a helicopter, said cable means allowing easy entry over the top of said ring and being connected to the deck and limited in movement relative to the ring so that when the device is suspended by the cable means, the major lifting forces are transmitted to the deck while the ring is held well spaced above the deck, and wherein said deck comprises a series of flat metal bars set on edge and forming a grid pattern.



4,627,822

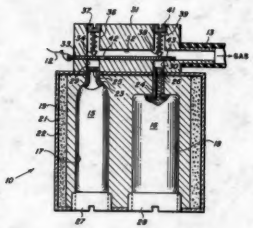
LOW TEMPERATURE INFLATOR APPARATUS

John J. Esposito, Langhorne, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 20, 1985, Ser. No. 729,725

Int. Cl.[4] B63C *9/12*

U.S. Cl. 441—92 **7 Claims**



1. A low temperature inflator apparatus for an inflatable device comprising, in combination:

first means containing a liquified gas;

second means containing a combustible solid;

heat transfer means contiguous with said first means and said second means for transferring to said first means heat generated by combustion of said solid;

actuator means operatively connected to said first and second means for concomitant actuation of said first and second means and formed to conduct the gases therefrom to the inflatable device.

4,627,823

SAFETY LATCHED AUTOMATIC ACTUATOR AND THROWABLE PERSONAL FLOTATION ASSEMBLY

Glenn Mackal, 4923 - 59th Ave., South, St. Petersburg, Fla. 33707

Filed Jul. 23, 1984, Ser. No. 633,607
Int. Cl.[4] B63H *16/06*
U.S. Cl. 441—95 18 Claims

1. A safety latched automatic actuator for actuating an inflator, the inflator including a striker pin reciprocatingly mounted within a body for fracturing a frangible seal of a cartridge containing compressed gas, the actuator comprising in combination:

a housing including a bottom portion and a top portion;

an actuator pin mounted within the housing, the actuator pin being movable to and from a safety position, a cocked position, and an actuated position;

a first means for operatively connecting the actuator pin within the housing to actuate the striker pin of the inflator when the actuator pin moves from the cocked position to the actuated position;

a fluid-activated trigger assembly for preventing the actuator pin from moving from the cocked position to the actuated position until triggering of the trigger assembly by exposure to a fluid; and

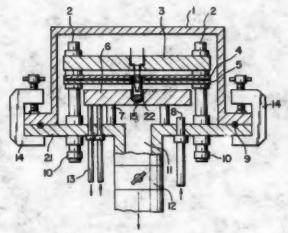
safety latch means for retaining the actuator pin in the safety position when the safety latch means is in a non-armed position, and for permitting the actuator pin to move from the safety position to the cocked position and, upon triggering of the trigger assembly, to further move to the actuated position when the safety latch means is moved from the non-armed position to an armed position, the safety latch means comprising a latch lever movable to and from the non-armed position and the armed position, and further comprising second means for operatively connecting the latch lever to the actuator pin to retain the actuator pin in the safety position when the latch lever is in the non-armed position and to permit the actuator pin to move from the safety position to the cocked position and, upon triggering of the trigger assembly, to further move to the actuated position when the latch lever is in the armed position, the second connecting means comprising a retaining pin positioned transversely through a proximal end of the actuator pin protruding from the top portion of the housing, the latch lever comprising a non-removable forked safety latch lever having a pair of legs defining a slotted opening therebetween for receiving the proximal end of the actuator pin, each of the legs including a retaining pin slot disposed therein for slidably and rotatably receiving the respective end of the retaining pin, the retaining pin being aligned and extending into the respective retaining pin slots such that the retaining pin bears against the edges of the retaining pin slots to retain the actuator pin in the safety position when the forked latch lever is in the non-armed position and, upon pivotable movement of the forked latch lever about the axis of the retaining pin, such that the longitudinal axes of the retaining pin slots are substantially parallel to the axis of the actuator pin when the forked latch lever is in the armed position to allow free movement of the retaining pin in the retaining pin slots.

4,627,824

METHOD OF AND APPARATUS FOR MANUFACTURING SMALL-SIZE GAS-FILLED LAMPS

Jitsuo Hamai, Tokyo, Japan, assignor to Hamai Electric Lamp Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1984, Ser. No. 568,850
Claims priority, application Japan, Jan. 12, 1983, 58-3872; Jan. 12, 1983, 58-3874; Jan. 12, 1983, 58-3875; Jan. 12, 1983, 58-3876; Jan. 12, 1983, 58-3880
Int. Cl.[4] H01J *9/38, 9/18*
U.S. Cl. 445—27 6 Claims



4. A method of manufacturing a gas-filled lamp, comprising the steps of:

providing an openable structure defining therein a sealable and pressurizable chamber;

providing a hollow bulb having an open end and a closed lens-defining head at the other end;

providing a bead unit having a bead of a meltable material provided with a pair of lead wires projecting therethrough and joined together by a filament;

supporting said bulb on a cooling member which is positioned within said chamber by disposing the closed head end of the bulb within an upwardly-directed recess formed in the cooling member so that the bulb is supported in an upright position with the open end being disposed uppermost;

positioning a heating member within said chamber in direct surrounding relationship to the open end of said bulb so that said heating member is spaced upwardly from said cooling member;

positioning an insulator member vertically between said heating and cooling members and in close surrounding relationship to the bulb so as to prevent heating of the bulb except in the vicinity of the open end thereof;

supporting said bead unit within said chamber directly above said bulb so that said bead is suspended downwardly and disposed directly within the open end of said bulb;

closing and sealing said chamber after the bulb and bead unit have been positioned therein as defined above;

creating at least a partial vacuum within said chamber to effect withdrawal of air therefrom;

thereafter introducing a pressurized gas into said chamber at a pressure in excess of atmospheric pressure so as to fill said chamber and said bulb with said gas and to create an elevated pressure therein;

heating said open end of said bulb and said bead by said heating member to sealingly fuse them together while maintaining said chamber at said elevated pressure;

cooling the closed head of said bulb by the cooling member simultaneous with the heating step defined above so as to effect at least partial cooling of the gas within the bulb to maximize the quantity of gas within the bulb prior to and during the sealing of the bead and bulb together; and

thereafter terminating the heating step, relieving the pressure in the chamber, and removing the fused bulb and bead from the chamber.

4,627,825

APPARATUS FOR THE ANGULAR ADJUSTMENT OF A SHAFT, SUCH AS A CAMSHAFT, WITH RESPECT TO A DRIVE WHEEL

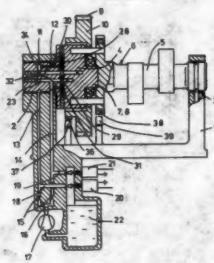
Karl-Heinz Bruss, Monchen-Gladbach, and Hans Baumgartner, Viersen, both of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co. KG, Neuss, Fed. Rep. of Germany

Filed Apr. 29, 1985, Ser. No. 728,318

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415861

Int. Cl.[4] F01L *1/34;* F16D *3/10*

U.S. Cl. 464—2 25 Claims



1. Apparatus for the relative angular displacement of a shaft and a drive wheel for said shaft in which said angular displacement is effected by hydraulic means as a function of whether or not pressure fluid is fed to the apparatus, said apparatus comprising at least one pair of hydraulic cylinders disposed in radial opposition in said shaft and including respective pistons displaceable in opposite directions in said cylinders, and three position valve means for controlling flow of pressure fluid to said hydraulic cylinders for controlling relative angular displacement between said shaft and drive wheel, said valve means having first and second end positions and an intermediate position, said valve means in each said end position pressurizing a respective cylinder while the other cylinder is vented to effect relative angular displacement selectively in opposite directions, said cylinders being unvented with the valve means in said intermediate position to block said pistons.

4,627,826

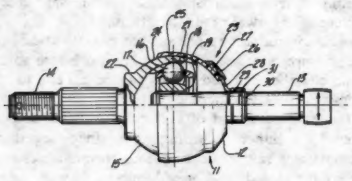
MULTI-SEGMENT, NON-FLEXIBLE BOOT FOR MECHANICAL JOINT

Peter M. Juziuk, Huntington Woods, and Daniel W. Hazebrook, Detroit, both of Mich., assignors to GKN Automotive Components Inc., Southfield, Mich.

Filed Feb. 15, 1985, Ser. No. 702,051

Int. Cl.[4] F16D *3/84*

U.S. Cl. 464—171 12 Claims



1. A boot for sealing a power transmitting mechanical joint, said joint comprising an input shaft, an output shaft, an outer race connected to one of said shafts, and means to transmit power from the other of said shafts to said outer race, said outer race having a spherical outer surface, said input shaft and said output shaft being subject to articulation relative to one another during the operation of said mechanical joint, said boot comprising, in combination:

a first portion comprising a first boot segment formed from a non-flexible material and surrounding a portion of said spherical outer surface of said outer race, said first portion having a spherical inner surface which engages said spherical outer surface of said outer race in surface-to-surface sealing relationship therewith, said first portion having a spherical groove which faces the other of said shafts and being capable of articulating with respect to said outer race without the loss of the sealing relationship therewith; and

a second portion comprising a second boot segment formed from a non-flexible material and extending from said first portion and sealingly engaging the other of said shafts, said second portion, together with said first portion, sealing the joint between said outer race and the other of said shafts to retain lubricant within said joint and to prevent dirt and other contaminants from entering said joint, said second portion having a spherical end which is sealingly and slidingly received in said spherical groove of said first portion and being capable of being sealingly articulated with respect to said first portion;

said spherical groove in said first portion being of a limited extent so that the articulation of said second portion with respect to said first portion causes said spherical end of said second portion to bottom in said spherical groove in said first portion, said boot being capable of further articulation by the articulation of said first portion with respect to said outer race of said power transmitting mechanical joint after said spherical end of said second portion bottoms in said spherical groove in said second portion.

4,627,827

DEVICE FOR THE ASSEMBLY ESPECIALLY OF THE JOINT OF THE CHAIN-GUIDE TENSIONING ARM OF THE SPEED CHANGE GEARS FOR BICYCLES AND SIMILAR VEHICLES

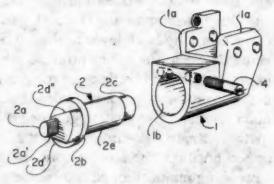
Henri Juy, 3-5 rue de la Breuchilliere, Dijon zone industrielle Dijon, St-Appolinarie, France

Filed Apr. 26, 1985, Ser. No. 727,567

Claims priority, application France, Apr. 24, 1984, 84 06761

Int. Cl.[4] F16H *9/00*

U.S. Cl. 474—80 10 Claims



1. Device for the assembly of the joint of the chain-guide tensioning arm of speed change gears for bicycles and similar vehicles, in which the tensioning arm (D) is swivelling with a limited angular motion in both directions under an elastic pushing action in one direction, in a bracket (1) at a lower part of a crosswise motion system (C) of the change gear, wherein a joint bolt (2) of the tensioning arm (D) is fastened integral with said chain-guide tensioning arm or with a flange (Da) of this arm, while a lower support (1) which is arranged to be fastened to the crosswise motion system (C) of the change gear, is provided with a cylindrical recess (1*b*–1*c*) to accomodate said bolt, said recess being open on the tensioning arm end and closed on an external end, characterized in that a rod (4) or equivalent means is mounted in a lower bracket (1) perpendicularly to a cylindrical recess axis (1*b*) and secant with a peripheral part of said recess, to assume a dual function of holding the bolt (2) with respect to the bracket (1) and end stopping the

rotation of the tensioning arm (D) integral with the bolt (2) with respect to the bracket (1), due to the arrangement of a bearing surface (2*d*) of the bolt which is in a plane with and opposite the rod (4); an elastic means (5) for re-tensioning the tensioning arm being mounted inside the bracket and connected to the bolt and to said bracket.

4,627,828

TOOTHED BELT

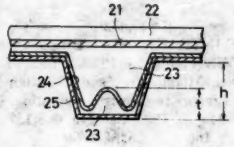
Takaji Nagai; Hiroyuki Ookawa; Takahide Mizuno; Fumihito Nakagawa, and Yoshiaki Onaka, all of Hyogo, Japan, assignors to Mitsuboshi Belting Ltd., Hyogo, Japan

Filed Feb. 24, 1984, Ser. No. 583,465

Claims priority, application Japan, Oct. 7, 1983, 58-156626[U]

Int. Cl.⁴ F16G *1/08*

U.S. Cl. 474—205 **9 Claims**



1. A toothed belt comprising: a rubber substrate in which a plurality of teeth are formed; an inner fabric layer covering said teeth, said inner fabric layer having a large mesh size, large stretchability, a warp of 30 to 210 d, a thermal weft, and a sum of cover factors of said warp and weft of no more than 20; and an outer fabric layer outside of and covering said inner fabric layer.

4,627,829

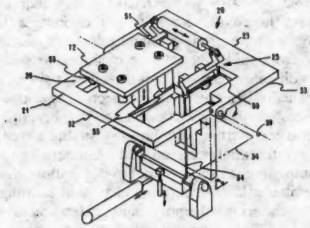
CENTERFOLD FORMING APPARATUS FOR A DISK ENVELOPE

William A. Brady, Jr., Lake Worth; Stanley R. Jordan, Boca Raton; Eugenio J. Morgado, Miami; Julius J. Perlini, Boynton Beach, and Alfred A. Stricker, Pompano Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 4, 1985, Ser. No. 698,513

Int. Cl.⁴ B31B *21/02, 21/26, 21/60*

U.S. Cl. 493—189 **4 Claims**



1. Apparatus for preforming an envelope for a plastic disk from a prepunched, flexible, plastic blank having two sections connected at the heads thereof and containing a drive hole at the same location in each section, one section having folding flaps extending from three edges thereof comprising:

a first and second folding plate positioned head to head each having a first and second surface thereon so that the first surfaces thereof are contiguous and lie in the same horizontal plane,

means for holding said flexible plastic material blank against said first surfaces of said first and second folding plates,

drive means for providing pivoting motion between said first and second folding plates to move said folding plates in an arcuate path so that the first surfaces are positioned in vertical planes facing each other,

a hub located at the same location in each first surface of each first and second folding plate so that said hubs register with one another when said plates are positioned in the vertical planes, said drive hole in each section of the flexible blank fitting over said respective hub to locate the blank on said first surfaces,

a mandrel extendable vertically and having an edge thereof in the extended position pressing against said blank in the area between said first and second plates pulling said drive holes in the blank taut on said hubs thereby locating the center line of said blank,

said drive means moving said folding plates from the horizontal to the vertical facing position causing said blanks to bend along the pressing edge of said mandrel forming the centerfold,

side flap fold forming apparatus attached to the second surface of the one of said first and second folding plates having said section of said blank having folding flaps extending from the three edges thereof held on said first surface thereof,

a side flap fold sealing apparatus attached to the back surface of the other of said first and second folding plates, said side flap folding and sealing apparatus being in operating position when said folding plates are positioned so that said first surfaces are positioned in vertical planes facing each other to form said centerfold,

cutout sections located along the side edges of said first and second folding plates and providing room for said side flap folding apparatus to fold said side flaps about said mandrel and for said sealing apparatus to perform said sealing operation on said folded flaps, respectively,

means for heating said centerfold and said side flap folds to a predetermined temperature to anneal the material, thereby reducing internal stresses therein.

4,627,830

BOX-ERECTING MACHINE

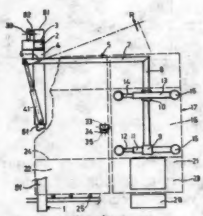
Joseph J. Smidt, Const. Huygenslaan 51, 2332 TS Leiden, Netherlands

Filed Apr. 18, 1985, Ser. No. 724,591

Claims priority, application Netherlands, Apr. 18, 1984, 8401256

Int. Cl.⁴ B31B *1/80*

U.S. Cl. 493—316 **3 Claims**



1. A box-erecting machine, comprising:

(a) a frame with support means for receiving a stack of tubular box blanks disposed one against the other in a substantially vertical orientation;

(b) means comprising an arm provided with a plurality of suction cups for engaging a wall of the forwardmost box blank of said stack of blanks and withdrawing said wall in a forward direction so that it forms the leading wall of an erected box;

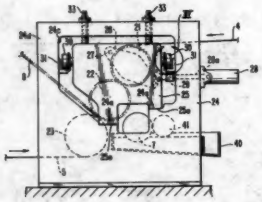
(c) a leg supporting said arm such that the arm is rotatable in a plane parallel to the plane of said leading wall of the box blank;
(d) a sleeve connected to said leg;
(e) a guide rod supporting said sleeve for non-rotatable movement in a direction perpendicular to the plane of said leading wall, said guide rod being disposed at one side of said frame, such that an edge of said box blank not forming part of the leading wall is disposed adjacent said one side of said frame;
(f) guiding means connected to said frame for preventing movement of the edge of a box blank disposed adjacent said one side of said frame during initial movement of the leading wall, for thereafter providing further unfolding of said box blank and for moving upwardly the bottom flap of the box blank connected to said leading wall;
(g) means comprising a lever, supported by said frame at a point below said stack for rotation in a plane perpendicular to said leading wall, for bringing the rear bottom flap of said box blank into the closed position thereof;
(h) a motor drive means associated with said arm for rotating said arm in said parallel plane through a predetermined angle;
(i) a motor drive means associated with said sleeve for moving said sleeve in said perpendicular direction to and fro along said guide rod; and
(j) control means associated with said suction cups and said motor drive means for rotating said arm, for controlling the application of suction to said suction cups, for controlling release of said suction from said suction cups, and for switching on and off said motor drive means for rotating said arm.

4,627,831

SINGLE FACER

Tadashi Hirakawa; Kiyomitsu Yoshikawa; Shigenari Yoshioka, and Hiroaki Sasashige, all of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1984, Ser. No. 681,785
Claims priority, application Japan, Jan. 20, 1984, 59-7083; May 2, 1984, 59-64994[U]; May 2, 1984, 59-64995[U]; May 2, 1984, 59-64996[U]
Int. Cl.[4] B31F *1/28;* B31B *1/88*
U.S. Cl. 493—337 **11 Claims**



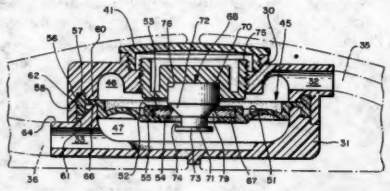
1. A single facer comprising:
a main frame;
a paste application roll rotatably supported on said main frame, said paste application roll having a roll axis extending in a transverse direction;
a pressure roll rotatably supported on said main frame, said pressure roll having a roll axis which is parallel to said transverse direction;
a movable frame movable in said transverse direction between a fixed position on said main frame for making a single-faced corrugated sheet and a position off of said main frame;
a lower corrugated roll rotatably supported on said movable frame, said lower corrugated roll having a roll axis parallel to said transverse direction;
an upper corrugated roll rotatably mounted on support means pivotally mounted on said movable frame, said upper corrugated roll having a roll axis parallel to said transverse direction,
means on said main frame for supporting said movable frame in said fixed position on said main frame; and
transfer means for moving said movable frame in said transverse direction between a position vertically above said fixed position at which said movable frame is supported by said main frame and said position off of said main frame at which said movable frame is not supported by said main frame for replacing said movable frame with another movable frame having corrugated rolls with corrugations of a different height and pitch, said transfer means including means on one of said main frame and said movable frame for moving said movable frame vertically between said position vertically above said fixed position and said fixed position on said main frame for making single-faced corrugated sheet.

4,627,832

THREE STAGE INTRACRANIAL PRESSURE RELIEF VALVE HAVING SINGLE-PIECE VALVE STEM

Michael D. Hooven, Miami, Fla., and Christian Sainte-Rose, Paris, France, assignors to Cordis Corporation, Miami, Fla.

Filed May 8, 1984, Ser. No. 608,137
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—9 **15 Claims**



1. A valve for regulating the flow of fluid from one location in the body to another location, comprising:
a bio-compatible housing;
a flexible bio-compatible diaphragm dividing the interior of said housing into first and second interior chambers;
inlet port means for establishing fluid communication between said first interior chamber and the one location;
outlet port means for establishing fluid communication between said second interior chamber and the other location;
a bio-compatible valve seat carried on said diaphragm for movement therewith, said valve seat defining a fluid passageway having a predetermined minimum diameter and opening from said first interior chamber to said second interior chamber, and defining a first valving surface concentrically oriented with respect to the axis of said fluid passageway, said valve seat and diaphragm having a static position within said housing in the absence of a pressure differential between said chambers;
means comprising an elongated bio-compatible valve closure member attached at one end to said housing within said first interior chamber and extending therefrom through said fluid passageway into said second interior chamber, said valve closure member being axially aligned with the axis of said passageway and defining a second valving surface concentrically oriented with respect to said axis for coacting with said first valving surface to form a flow restriction within said passageway between said first and second chambers;
said second valving surface including, progressing from said valve closure member, a first portion progressively decreasing in diameter from a first predetermined diameter greater than said minimum diameter of said passageway to

a second predetermined diameter less than said minimum diameter, and a second portion of finite axial extend having a maximum diameter greater than said second predetermined diameter and less than said mimimum diameter of said passageway;

said second valving surface coacting with said first portion of said first valving surface when said valve seat is in said static position to close said passageway to provide a first valving mode wherein said flow between said first and second interior chambers is prevented; and

said diaphragm being displaceable from said static position in a direction along said axis of said fluid passageway away from said one end of said valve closure member in response to an increase in pressure differential between said first interior chamber and said second interior chamber to cause said first valving member to successively coact with said first and second portions of said second valving surface, and successively to be axially spaced from said second portion, thereby providing second, third and fourth valving modes, in said second valving mode fluid flow occurring between said interior chambers so as to maintain a first substantially constant predetermined pressure in said first chamber, in said third valving mode fluid flow remaining substantially constant between said chambers notwithstanding changes in differential pressure, and in said fourth valving mode fluid flow occurring between said chambers to maintain a second substantially constant predetermined pressure in said first interior chamber.

4,627,833

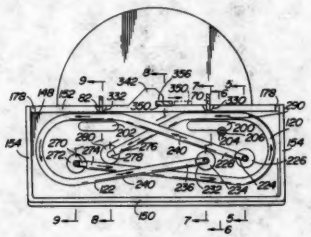
MICROSURGICAL SYSTEM CASSETTE ASSEMBLY

Kenneth P. Cook, Blue Bell, Pa., assignor to Site Microsurgical Systems, Inc., Horsham, Pa.

Continuation of Ser. No. 383,635, Jun. 1, 1982, Pat. No. 4,493,695. This application Jun. 4, 1984, Ser. No. 616,633

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—34 **11 Claims**



1. A cassette assembly adapted for releasable securement to a control console for use in ophthalmic surgery comprising:

a housing having at least one rigid surface and having an externally accessible suction port;

a first port internal to said housing in fluid communication with said suction port;

a second port internal to said housing and means through which fluid may flow to a source of vacuum in a control console;

a first occludable tubular conduit means disposed in said housing and coupled between said first and second ports and providing fluid communication therebetween;

at least a portion of said occludable tubular conduit means aligned with said housing rigid surface;

a collection vessel supported by said housing and having a first port for providing fluid communication between a source of vacuum and said collection vessel and having a second port in fluid communication with said first occludable tubular conduit means.

4,627,834

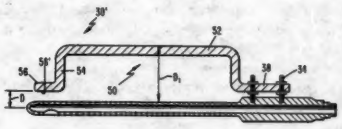
APPARATUS FOR PERFORMING SUCTION LIPECTOMY

Hans Lee, Suite 200, 415 Morris St., Charleston, W. Va. 25301

Continuation-in-part of Ser. No. 607,714, May 7, 1984. This application Sep. 18, 1984, Ser. No. 651,720

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—49 **5 Claims**



1. A device for surgically aspirating subcutaneous fatty tissue and the like from an animate body, comprising:

(a) a cannula having a tip and a handle at opposite ends thereof, the tip being formed with a hole and a longitudinal passage extending through the cannula in communication with the hole, said passage being connectable to a source of vacuum so that suction can be applied to surgically aspirate fatty tissue through the hole when the tip is inserted into the tissue;

(b) a guide bar having one end connected to the cannula at a portion thereof remote from the tip and an opposite end portion terminating adjacent the hole and spaced a first predetermined distance D from the tip, said opposite end having a guide surface in contact with, during surgery, a portion of the skin overlying the fatty tissue to limit the depth at which the hole penetrates the tissue, said guide bar including an elevated portion formed between the guide surface and the said one end of the guide bar and spaced a second predetermined distance D1 from a part of the cannula formed adjacent said elevated portion, wherein D1>D, said elevated portion being manually engageable by one hand of the surgeon while the surgeon's other hand engages the gripping portion of the cannula to thereby facilitate surgical manipulation of said device by allowing the surgeon to manually direct the length of the cannula and the tip through the tissue in reciprocating strokes with the guide surface being in substantially constant contact with the surface of said skin overlying the fatty tissue during said strokes; and

(c) means for connecting the guide bar to the cannula.

4,627,835

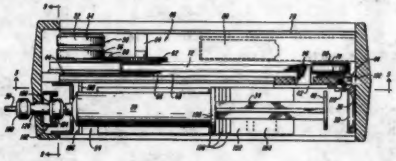
TUBING ASSEMBLY FOR INFUSION DEVICE

Paul V. Fenton, Jr., Marblehead, Mass., assignor to Strato Medical Corporation, Beverly, Mass.

Filed Mar. 11, 1985, Ser. No. 710,011

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—67 **12 Claims**



1. In an infusion device and syringe positioned therein, said infusion device including means for driving the plunger of said syringe along a reference axis toward a fluid dispensing outlet port thereof, wherein said infusion device includes a support member for supporting said syringe said support member in-

cluding at least one support surface, the improvement comprising:

a tube assembly coupled to said fluid dispensing outlet port of said syringe including:

A. an elongated tube defining a central bore therethrough, and

B. a rigid connector member affixed to said tube and defining a linear central bore extending therethrough, said bore defining a continuous passageway extending from an input port of said connector member, and said connector member including means for coupling said input port to said outlet port of said syringe,

wherein said connector member includes at least two support portions spaced apart along the axis of said connector member central bore and an interface portion connecting said support portions, and

wherein the outer surfaces of said support portions are substantially identical in shape, said shape being adapted to interfit with said one support surface of said support member, whereby either of said support portions may be supported by said one support surface of said support member.

4,627,836

CARDIOVASCULAR PROSTHETIC DEVICES AND IMPLANTS WITH POROUS SYSTEMS

David C. MacGregor, 81 Wimbleton Road, Islington, Ontario, Canada

Division of Ser. No. 351,526, Feb. 23, 1982, Pat. No. 4,459,252, which is a division of Ser. No. 95,965, Nov. 20, 1979, Pat. No. 4,355,426, which is a division of Ser. No. 824,296, Aug. 15, 1977, Pat. No. 4,281,669, which is a continuation-in-part of Ser. No. 683,382, May 5, 1976, Pat. No. 4,101,984. This application Jun. 30, 1983, Ser. No. 486,796

Claims priority, application Canada, May 9, 1975, 226993; United Kingdom, Dec. 22, 1975, 52474/75; Canada, Aug. 13, 1976, 259054; United Kingdom, Oct. 19, 1976, 43407/76

Int. Cl.[4] A61M *11/00*

U.S. Cl. 604—93 **5 Claims**

1. A blood stream controlled release device comprising a hollow chamber containing a source of material to be released to blood and a porous surface of said chamber adapted to interface with a blood stream to establish communication between the blood stream and the interior of the chamber to permit said material release into the blood through a network of interconnected pores, said porous surface being formed of rigid material inert to blood and selected from metals, polymeric materials, ceramics and carbon, said porous surface having a porosity of at least 8% by volume up to the limit of coherence of the surface, an interstitial pore size of about 1 to about 1000 microns and a thickness up to 1 cm.

4,627,837

CATHETER DEVICE

German Gonzalo, 30 Oaklane Dr., Ottawa, Ill. 61350

Filed May 30, 1984, Ser. No. 615,399

Int. Cl.[4] A61M *29/00*

U.S. Cl. 604—101 **16 Claims**

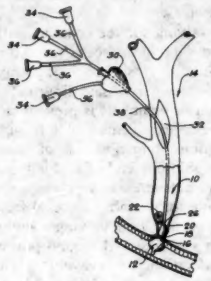
1. A catheter device for use in removing biliary stones, comprising:

a main channel;

means for removing biliary stones from the common duct mounted on said channel including an inflatable balloon and means for remotely inflating the same;

biliary stone removal means for removing biliary stones from the common duct;

anchoring means for securing the catheter in the common duct; and



fluid exuding means for flushing biliary stones as they are removed from the common duct, said fluid exuding means being connected to said balloon.

4,627,838

STYLET ACTUATED WINGED CATHETER

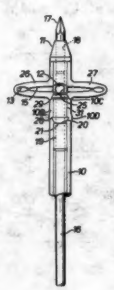
David E. Cross, Tyne and Wear; Robert D. Adams, Bristol, and Terence J. Floyd, Bath, all of England, assignors to Bard Limited, Sunderland, England

Filed Dec. 10, 1984, Ser. No. 679,947

Claims priority, application United Kingdom, Dec. 9, 1983, 8332983; Dec. 7, 1984, 8430924

Int. Cl.[4] A61M *29/00*

U.S. Cl. 604—105 **27 Claims**



1. A catheter comprising a patient (distal) end for location in a bodily cavity in a human or animal body, an outer (proximal) end to remain outside the body, a catheter tube which defines a fluid flow passage connecting the patient end and the outer end, a catheter retaining wind assembly immediately inward of the patient end which wing assembly is movable between a transport disposition wherein its diameter is substantially that of the flow passage and a retaining disposition wherein its diameter is sufficiently greater than that of the flow passage to prevent withdrawal of the patient end from the cavity, and actuating means removably received within and running the length of the catheter tube, said actuating means being manipulable from the said outer end for moving the retaining wing assembly from the transport disposition into the retaining disposition as said actuating means moves from said catheter tube through said outer end, and which is thereafter removed from the catheter, releasable latching means for releasably securing said actuating means to said catheter tube adjacent said patient end for movement of said patient end toward said

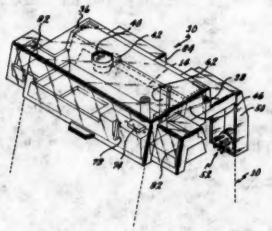
outer end upon longitudinal retraction of said actuating means from said catheter tube through said outer end to effect said movement of said wing assembly into said retaining disposition, said latch means releasing upon predetermined increase in resistance to movement of said patient end, and means for providing said predetermined increase in resistance, said retaining wing assembly comprising first and second holding surfaces which interlock upon engagement, said first and second holding surfaces being spaced from one another in the transport disposition and engaging each other as the retaining wing assembly moves into the retaining disposition to sustain the retaining wing assembly on the retaining disposition.

4,627,839

PATIENT CONTROLLED ANALGESIA CONVERSION

Joe W. Young, Laguna Hills, Calif., assignor to American Hospital Supply Corporation, Deerfield, Ill.

Filed Nov. 21, 1985, Ser. No. 800,281
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—121 **4 Claims**



1. An accessory for converting a programmable infusion pump to a patient-controlled analgesia device, comprising:

(a) a converter shaped to fit on said pump, said converter having a cover portion movable between an open position in which said converter is releasable from said pump and a closed position in which said converter can be secured to said pump;

(b) lockout switch means on said converter for preventing modification of the program of said infusion pump when said cover portion is closed, said lockout switch means being inaccessible when said cover portion is closed;

(c) dosing switch means attached to said converter for triggering operation of said pump under patient control, said dosing switch means being accessible when said cover portion is closed;

(d) connector means on said converter for electrically connecting said switch means to said pump;

(e) connector latching means for releasably holding said connector means in engagement with said pump, said latching means being inoperable to release said connector means when said cover portion is closed; and

(f) locking means for selectively locking said cover portion into said closed position and to secure said converter to said pump.

4,627,840

FLOW MONITORING DEVICE

Emilio Cuadra, and Roberto DelValle, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

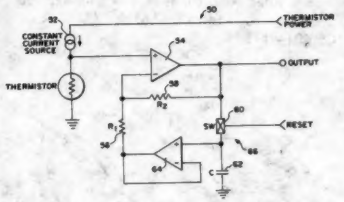
Filed Jan. 28, 1985, Ser. No. 695,303
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—151 **17 Claims**

1. A pulsatile flow monitoring device in combination with an implantagle drug delivery system which includes a solenoid actuated pump and which delivers a drug in quantatized liquid doses at measured intervals, said pulsatile flow monitoring device comprising:

a liquid conduit for conveying liquid drug doses, said conduit having a wall establishing a lumen in said conduit and an inside wall surface and an outside wall surface, said conduit wall having a portion of normal thickness and a reduced-in-thickness portion which is at least moderately thermally conductive;

temperature sensing means mounted to said liquid conduit on the outside surface of the reduced-in-thickness wall portion for transducing the temperature of the reduced-in-thickness wall portion, the temperature of which varies with the flow of liquid drug doses;

an electrical power supply coupled to said temperature sensing means for providing electrical energy to said temperature sensing means;



regulating means coupled to said power supply for determining a rate at which electrical energy is provided to said temperature sensing means during preselected and discrete power delivery intervals related to said measured intervals; and

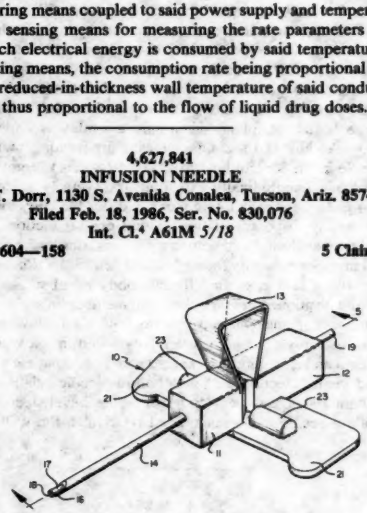
measuring means coupled to said power supply and temperature sensing means for measuring the rate parameters at which electrical energy is consumed by said temperature sensing means, the consumption rate being proportional to the reduced-in-thickness wall temperature of said conduit and thus proportional to the flow of liquid drug doses.

4,627,841

INFUSION NEEDLE

Robert T. Dorr, 1130 S. Avenida Conalea, Tucson, Ariz. 85748

Filed Feb. 18, 1986, Ser. No. 830,076
Int. Cl.[4] A61M 5/18
U.S. Cl. 604—158 **5 Claims**



1. An infusion device comprising:

a catheter having a blunt end;

a catheter hub attached to said catheter and spaced from said blunt end;

a hollow needle having a first end and a sharpened tip at a second end,

a needle hub attached to said needle at said first end;

said catheter being telescopically received in said needle with said needle hub adjacent said catheter hub,

the telescoping respective lengths of said catheter and said needle being such that said blunt end of said catheter

protrudes from said sharpened tip of said needle when said hubs are in contact;

spring means interconnecting and biasing said hubs toward each other; and

wedge means mounted on one of said hubs and insertable between said hubs to separate said hubs against the restoring force exerted by said spring means a distance sufficient to cause said sharpened tip of said needle to protrud beyond said blunt end of said catheter.

4,627,842

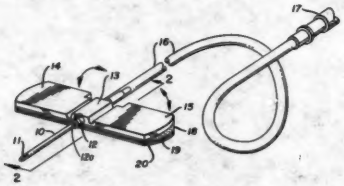
INTRAVENOUS NEEDLE ASSEMBLY

William Katz, 548 Gypsy La., Youngstown, Ohio 44505

Filed Nov. 19, 1984, Ser. No. 672,926

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—177 **4 Claims**



1. An improvement in an intravenous needle assembly having an elongated flexible body member with a central section and oppositely extending sections wih respect thereto and a hollow needle having a beveled end positioned through said central section transversely of said elongated flexible body member on a transverse horizontal plane; the improvement comprising first means for tilting said elongated flexible body member, and the hollow needle from said transverse horizontal plane to an angular transverse plane with respect to said transverse horizontal plane when said assembly is applied to a patient's skin, and secondary means for rotating said hollow needle on its longitudinal axis, said first means comprising at least one longitudinally extending transversely tapered resilient pad positioned on said elongated flexible body member in oppositely disposed relation to said central section and said hollow needle and said secondary means comprising a cylindrical member rotatably located in said central section and transversely of said elongated flexible body member, said hollow needle positioned in said cylindrical member on said transverse horizontal plane whereby positioning said hollow needle of said assembly through a patient's skin and into a vein of said patient and engaging said tapered pad on said patient's skin tilts said central section and said hollow needle relative to said patient's skin and vein and spaces the beveled end of said hollow needle in unencumbered relation to the walls of said vein.

4,627,843

GUARD FOR RIGHT ANGLE INFUSION NEEDLE

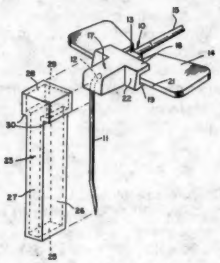
Kenneth C. Raines, Bethlehem, Pa., assignor to Burron Medical Inc., Bethlehem, Pa.

Continuation-in-part of Ser. No. 747,569, Jun. 24, 1985. This application Sep. 26, 1985, Ser. No. 780,310

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—263 **8 Claims**

1. A guard for a right angle infusion needle having a wing and finger pad attachment comprising an elongated trough-like body portion having an open side and being adapted to receive and protect the shank of the infusion needle, and a socket extension on one end of the trough-like body portion and extending at right angles to said body portion, said socket extension having a cross-sectional shape corresponding to the shape of a part of said wing and finger pad attachment and



receiving said part to releasably hold the infusion needle assembled with said guard.

4,627,844

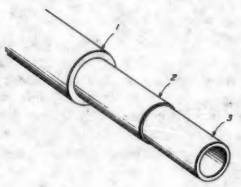
TRI-LAYER TUBING

Jerry A. Schmitt, Lionville, Pa., assignor to High Voltage Engineering Corporation, Burlington, Mass.

Filed Oct. 30, 1985, Ser. No. 792,904

Int. Cl.[4] A61M *5/325, 25/001*

U.S. Cl. 604—264 **5 Claims**



1. A coextruded tri-layered medical-surgical tubing for the administration of common medicines such as insulin and nitroglycerin solutions, said tubing comprising an outer layer of polyvinyl chloride, a core layer of low-density polyethylene, and an intermediate layer of an ethylene-vinyl acetate copolymer interposed between said outer layer and said core layer.

4,627,845

EYES-BATHING FAUCET-MATEABLE STRUCTURE

Frank E. DeMotte, MR-18 Blue Mill Rd., Morristown, N.J. 07960

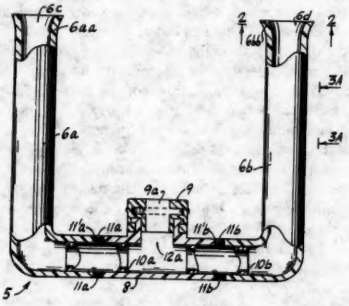
Filed Dec. 4, 1984, Ser. No. 678,052

Int. Cl.[4] A61H *35/00*

U.S. Cl. 604—295 **5 Claims**

1. An eye-bathing device for mating with a faucet, comprising in combination: portable tubular structure separate from non-portable water faucet structure, and having a water-inlet end and having water-outlet ends interconnected by tubular through space therebetween adapted for continuous flow of water into and from said water-inlet end to and out-of said water-outlet ends said tubular through space including means for slidable adjustment to lesser or greater distances of space between said water-outlet ends and said water-inlet end comprising a water-faucet flexible-attaching means adapted for detachably intermittently mounting and mating said water-inlet end on a rigid spigot-outlet structure of a conventional water-faucet for continuous passage of water from the conventional water-faucet through the water-inlet end into said tubular space, and said water-outlet ends being substantially oval in

shape of circumscribing walls of outlet space of the water-outlet ends and being of a predetermined size such that the water-outlet ends are comfortably substantially fitable against or adjacent the eyes of a person while bathing water is continuously exiting the water-outlet ends, said water-outlet ends having circumscribing walls substantially flared, and there being two of said water-outlet ends spaced-apart a predetermined distance such that the two spaced-apart water-outlets are substantially alignable with paired eyes of an individual concurrently washing both eyes with water continuously flowing from the two spaced-apart water-outlet ends, and the water-faucet attaching means including alternate-faucet-attaching structure of flexible composition adapted to be mateable on faucet structures of the different conventional shapes and structures.

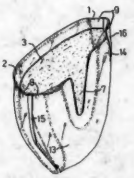


4,627,846

INCONTINENCE SHIELD FOR MEN

Maj I. Ternström, Mölnlycke, Sweden, assignor to Molnlycke AB, Goteborg, Sweden

Filed Jun. 12, 1984, Ser. No. 620,081
Claims priority, application Sweden, Jun. 27, 1983, 8303663
Int. Cl.[4] A61F 5/44
U.S. Cl. 604—349 **10 Claims**



1. An incontinence shield for men intended to embrace the penis of the wearer either fully or partially in a container-like fashion, and comprising an outer-side made of liquid-impermeable material, an innerside made of liquid-permeable material, and an intermediate body of absorbent material, the shield further comprising a front-piece, a back-piece and a centre-piece which connects said front-piece and said back-piece and is narrower than said pieces and forms the bottom of said container; the shield being arranged to embrace both the penis and the scrotum of the wearer;

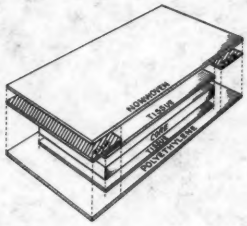
the back-piece having a slit or recess which extends from the free edge thereof; wing-like portions formed by said slit or recess and located on respective sides thereof adapted to be clamped securely against the body of the wearer, beneath the scrotum thereof, the absorbent body being soft and compressible, and in addition to functioning as an absorption medium being also arranged to impart a given requisite stability to said wing-like portions, so as to be compressibly mouldable beneath the scrotum of the wearer, thereby to hold the shield firmly in position.

4,627,847

HOT MELT ADHESIVE WASTE BARRIER

Paul P. Puletti, and Stanley J. Decowski, Jr., both of Glen Gardner, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 3, 1985, Ser. No. 719,196
Int. Cl.[4] A61F 13/16
U.S. Cl. 604—366 **1 Claim**



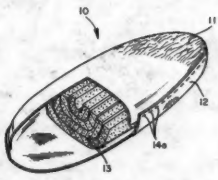
1. A disposable diaper comprising an absorbent core encased in an outer layer, wherein the outer layer comprises a liquid permeable nonwoven topsheet and a liquid impermeable backsheet portion; the diaper being provided with a leakage resistant waste barrier formed by coating a water insoluble or water impermeable hot melt adhesive onto the lateral end portions of the surface of the nonwoven topsheet which is in contact with the core, the barrier extending over a portion of the lateral end of the absorbent core.

4,627,848

ANATOMICAL PAD

Frederich O. Lassen; Dianne S. Masten, both of Winnebago County; Cheri L. Schultz, and Robert J. Peerenboom, both of Outagamie County, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 23, 1984, Ser. No. 603,064
Int. Cl.[4] A61F 13/20
U.S. Cl. 604—370 **30 Claims**



1. An elongate anatomical pad having a leading end and a distal end with an absorbent matrix, a fluid pervious cover overlying said absorbent matrix and a fluid impermeable baffle surrounding the portion of the absorbent matrix opposite said cover said absorbent matrix being ellipsoidal in horizontal and in vertical cross section dimensioned to be positioned essentially completely within the vulva with said device not contacting vaginal walls within the vulva with said device not contacting vaginal walls after positioning wherein the oval contour of the pad's vertical cross section enables said pad to mold against the folds of the labia providing a seal against fluid leakage and wherein said pad comprises a series of U-shaped absorbent layers with their layer orientation such that the longitudinal axis of the U is in the same direction as the longitu-

dinal axis of said pad and the ends of said U-shaped layers are adjacent said previous cover.

4,627,849

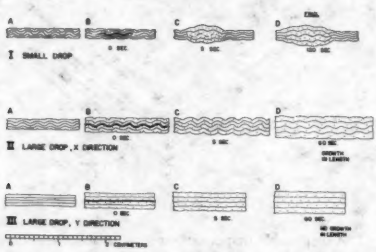
TAMPON

Richard R. Walton, Boston; Richard C. Walton, East Orleans; George E. Munchbach, Roslindale, all of Mass., and Robert W. Young, New York, N.Y., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 393,543, Jun. 30, 1982, abandoned. This application Jul. 11, 1985, Ser. No. 754,669

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—379 **33 Claims**



1. A tampon for absorbing menstrual discharge comprising at least one layer formed of absorbent fibers, said layer being in a prethickened, preshortened microundulated state as a result of longitudinal micro-compressive pretreatment prior to incorporation by subsequent compression into the form of said tampon,

said layer being characterized by being preshortened at least 20% of its original length in the direction of pretreatment, there being at least 10 microundulations per inch in said layer in the direction of said pretreatment, adjacent microundulations in said layer residing with their sides abutting one another, with the length of a microundulation being generally of the order of the thickness of said prethickened layer,

the microundulations of said layer being shape-retentive when dry with stored mechanical energy and being responsive to moisture to cause release of mechanical energy to expand in the direction of treatment of the layer to cause rapid expansion of said tampon during use.

4,627,850

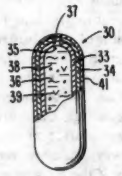
OSMOTIC CAPSULE

Joseph C. Deters, Mountain View; Felix Theeuwes, Los Altos; Kevin J. Mullins, Berkeley, and James B. Eckenhoff, Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Nov. 2, 1983, Ser. No. 548,219

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—892 **26 Claims**



1. An osmotic capsule for the delivery at a controlled rate of a beneficial agent formulation to a fluid environment of use, the osmotic capsule comprising:

(a) a lamina comprising in at least a part of a semipermeable composition that substantially maintains its integrity in the environment of use, is permeable to the passage of fluid present in the environment of use, and substantially impermeable to the passage of a beneficial agent formulation, the lamina surrounding:

(b) a capsule comprising a hydrophilic body and a matching cap telescopically joined to define a lumen;

(c) a beneficial agent formulation in the lumen, said formulation a member selected from the group consisting of solid, powdered, pulverized, micronized and particle formulations that form, when the osmotic capsule is in operation in the environment of use in the presence of fluid that enters the osmotic capsule, a member selected from the group consisting of a solution and suspension; and,

(d) at least one orifice through the lamina and the capsule communicating with the lumen and the exterior of the osmotic capsule for delivering the beneficial agent formulation from the osmotic capsule.

4,627,851

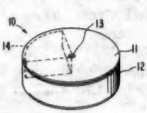
COLONIC-THERAPEUTIC DELIVERY SYSTEM

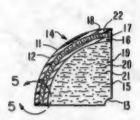
Patrick S. L. Wong, Hayward, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Oct. 26, 1984, Ser. No. 665,332

Int. Cl.[4] A61K *9/22, 9/24*

U.S. Cl. 604—892 **5 Claims**





1. An osmotic device for delivery a drug to a biological environment of use, said device comprising:

(a) a shaped laminated wall comprising: (1) a first lamina comprising a semipermeable composition permeable to the passage of fluid and substantially impermeable to the passage of drug; (2) a second lamina comprising a polymer and a salt of a fatty acid, said second lamina permeable to the passage of fluid; and a third lamina comprising a member selected from the group consisting of cellulose acetyl phthalate, cellulose diacetyl phthalate, cellulose triacetyl phthalate, cellulose acetate phthalate, hydroxypropyimethyl cellulose phthalate, cellulose ester phthalate, cellulose ether phathalate, sodium cellulose acetate phthalate, methyl cellulose phthalate, and hydroxypropl cellulose phthalate; said laminated wall surrounding and defining:

(b) a compartment containing a dosage amount of a beneficial drug formulation; and,

(c) at least one passageway through the laminated wall communicating with the compartment and the exterior of the osmotic device for dispensing the drug formulation from the device to the environment of use.

4,627,852

ACTIVE COMPOUND RELEASE SYSTEMS

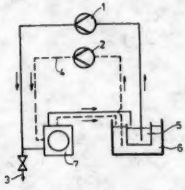
Miklos von Bittera, Leverkusen, and Rolf-Volker Meyer, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 681,977

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1983, 3347278

Int. Cl.[4] A61F 7/02

U.S. Cl. 604—897 15 Claims



1. In a medical plaster comprising a covering layer which is essentially impermeable to the active compound, an active compound reservoir layer and a protective layer which can be pulled off and which is essentially impermeable to the active compound, the improvement wherein the reservoir layer contains about 1–30% of active compound comprising an antiphlogistic in an elastomer mixture comprising a diene rubber which can optionally be randomly copolymerised with an α-olefin, mixed with from 0 up to about 70% by weight of a polyisobutylene, polybutadiene oil and/or paraffin oil, and a tackifying resin.

4,627,853

METHOD OF PRODUCING PROSTHESES FOR REPLACEMENT OF ARTICULAR CARTILAGE AND PROSTHESES SO PRODUCED

Todd D. Campbell, Corona, and Aws S. Nashef, Costa Mesa, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed May 29, 1985, Ser. No. 738,994

Int. Cl.[4] A61F 2/28, 2/38; A61K 35/32

U.S. Cl. 623—16 10 Claims

1. A method of producing a prosthesis for replacing articular cartilage comprising:

(a) machining a bone segment into a desired shape,

(b) differentially demineralizing said bone segment to produce both demineralized and non-demineralized portions of said bone segment, such that demineralized portion has a spongy texture similar to natural cartilage, and the non-demineralized portion is a matrix into which adjacent host bone grows,

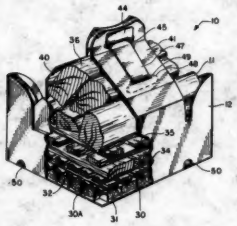
(c) tanning said bone segment to render it non-antigenic, biocompatible and stable.

4,627,854

SELF-CONTAINED LOG FIRE STARTING KIT

Lawrence M. Pratt, Los Gatos, Calif., assignor to Firebox Corporation, Los Gatos, Calif.

Filed Nov. 4, 1985, Ser. No. 794,643
Int. Cl.[4] C10L *11/00*
U.S. Cl. 44—40 1 Claim



1. A fire building kit comprising:
a carton made of combustible material and having a bottom wall, side walls and a handle extending from two side walls and over the top of said carton;
a spacer on said bottom wall;
kindling made of a combustible material resting on said spacer;
a plurality of first elongated logs of small cross section horizontally positioned on said kindling in layers with each layer being of first logs extending normal to the logs of the adjacent layer;
a plurality of second logs of greater cross section being positioned on said first logs and extending normal to said handle so as to be held tightly when the carton is lifted by said handle; and
a highly combustible fire starter such as paper inside said spacer whereby when said kindling is ignited, the first logs will burn evenly and provide a level platform during the ignition and burning of said second logs.

4,627,855

METHOD OF PREPARING AN AQUEOUS SLURRY OF SOLID CARBONACEOUS FUEL PARTICLES AND AN AQUEOUS SLURRY SO PREPARED

Mait M. Mathiesen, Summit, N.J., and Kent O. Svensson, Helsingborg, Sweden, assignors to AB Carbogel, Helsingborg and Berol Kemi AB, Stenunsund, both of, Sweden, a part interest

Filed Aug. 17, 1984, Ser. No. 419,996
Claims priority, application United Kingdom, Aug. 26, 1983, 8323011
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 17 Claims

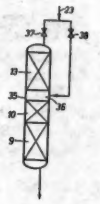
1. A method of preparing an aqueous slurry of about 65 to about 80% by weight of solid carbonaceous fuel particles consisting essentially of the following steps:
(a) conditioning the surfaces of said solid carbonaceous fuel particles by exposing them to the action of a reagent consisting essentially of at least about 0.0001% by weight, based upon the weight of the solid fuel particles, of a water-soluble chemical oxidising agent other than air to oxidise said surfaces and make the more hydrophilic and
(b) suspending the thus-conditioned carbonaceous fuel particles in water with the aid of a dispersion-producing amount of a water-soluble surface-active dispersant,
provided, however, that when the oxidising agent is oxygen, it is used in the presence of a catalyst.

4,627,856

PROCESS FOR THE ADSORPTIVE SEPARATION OF STEAM AND A LESS READILY ADSORBABLE COMPONENT FROM A GASEOUS STREAM

Ulrich von Gemmingen, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 679,670
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345438
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—31 8 Claims



1. In a process for the adsorptive separation of steam and less readily adsorbable component from a gaseous stream comprising passing the gaseous stream during an adsorption phase to the inlet end of an adsorber and withdrawing from the outlet end of the adsorber the gaseous stream depleted of steam and less readily adsorbable component; terminating the adsorption phase; passing a hot scavenging gas through the adsorber and withdrawing from the adsorber a scavenging gas loaded with desorbed less readily adsorbable component and steam; the improvement, in which the gaseous stream is air and the less readily adsorbable component is carbon dioxide which comprises passing the air stream during the adsorption phase, through two series-connected adsorption beds where the two adsorption beds are arranged in an adsorber common to both of them, the first adsorption bed being subdivided into two layers, wherein essentially only steam is adsorbed in the first layer contiguous to the inlet end of the adsorber, and wherein steam and carbon dioxide are absorbed in the second layer, the first adsorption bed in the adsorber contains alumina gel in the first layer and a zeolite molecular sieve in the second layer, and in the first adsorption bed, essentially the entire amount of steam is adsorbed and in the second adsorption bed, substantially only carbon dioxide is adsorbed; and passing the scavening gas during a first part of the hot-scavening phase, directly to the outlet end of the second adsorption bed and during a second part of the hot scavenging phase, directly to the outlet end of the first adsorption bed; and withdrawing, during a first and second part of the hot-scavenging phase, scavenging gas loaded with desorbed carbon dioxide and steam from the first adsorber inlet end.

8. In a process for the adsorptive separation of methanol and less readily adsorbable component from a gaseous stream comprising passing the gaseous stream during an adsorption phase to the inlet end of an adsorber and withdrawing from the outlet end of the adsorber the gaseous stream depleted of methanol and less readily adsorbable component; terminating the adsorption phase; passing a hot scavenging gas through the adsorber and withdrawing from the adsorber a scavenging gas loaded with desorbed less readily adsorbable component and methanol; the improvement in which the gaseous stream is air and the less readily adsorbable component in carbon dioxide which comprises passing the air stream during the adsorption phase, through two series-connected adsorption beds where the two adsorption beds are arranged in an adsorber common to both of them, the first adsorption bed being subdivided into two layers, wherein essentially only methanol is adsorbed in the first layer contiguous to the inlet end of the adsorber, and wherein methanol and carbon dioxide are adsorbed in the

second layer, the first adsorption bed in the adsorber contains alumina gel in the first layer and a zeolitic molecular sieve in the second layer, and in the first adsorption bed, essentially the entire amount of methanol is adsorbed and in the second adsorption bed, substantially only carbon dioxide is adsorbed; and passing the scavenging gas during a first part of the hot-scavenging phase, directly to the outlet end of the second adsorption bed and during a second part of the hot scavenging phase, directly to the outlet end of the first adsorption bed; and withdrawing during a first and second part of the hot-scavenging phase, scavenging gas loaded with desorbed carbon dioxide and methanol from the first adsorber inlet end.

4,627,857

CARBON MOLECULAR SIEVES AND A PROCESS FOR THEIR PREPARATION AND USE

Robert F. Sutt, Jr., Johnstown, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Division of Ser. No. 561,005, Dec. 13, 1983, Pat. No. 4,526,887, which is a continuation-in-part of Ser. No. 475,797, Mar. 16, 1983, abandoned. This application Mar. 7, 1985, Ser. No. 709,467

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—70 **20 Claims**

1. A process for separating gas mixtures containing components of at least two different molecular diameters, molecular weights or molecular shapes comprising passing the gas through a carbon molecular sieve prepared from a naturally occurring substrate and selected from the group consisting of molecular sieves having:

(a)

(i) an oxygen diffusivity of 800×10^{-8} cm^2/sec or less; and

(ii) a diffusivity ratio of oxygen to nitrogen of 15 to 100;

(b)

(i) an oxygen diffusivity of 600×10^{-8} cm^2/sec or less; and

(ii) a diffusivity ratio of oxygen to nitrogen greater than 100; and

(c)

(i) an oxygen diffusivity greater than 800×10^{-8} cm^2/sec; and

(ii) a diffusivity ratio of oxygen to nitrogen greater than 5; here the diffusivity is measured using a starting gas pressure of one atmosphere (+/−5%) at a temperature of 25° +/−5% for 30 seconds.

4,627,858

VACUUM CLEANER FILTER

Gernot J. M. Jacob, Weissach-Flacht, Fed. Rep. of Germany, assignor to Progress - Electrogeraete, Fed. Rep. of Germany

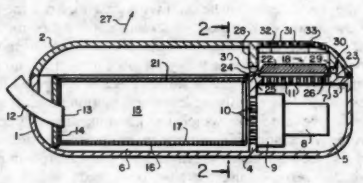
PCT No. PCT/EP84/00358, § 371 Date Jul. 11, 1985, § 102(e) Date Jul. 11, 1985, PCT Pub. No. WO85/02100, PCT Pub. Date May 23, 1985

PCT Filed Nov. 12, 1984, Ser. No. 756,978

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341458

Int. Cl.⁴ B01D *46/02*; A47L *9/14*

U.S. Cl. 55—126 **13 Claims**



1. A vacuum cleaner comprising a housing, an air inlet channel connected to said housing at one location and an air outlet for discharging exhaust air in said housing at a spaced location from said inlet channel, a dust collecting chamber in said housing, a filter dust bag in said dust collecting chamber connected to said inlet channel, a motor-fan unit in said housing, an exhaust air filter adjacent to said air outlet, a connecting piece connecting said filter dust bag to said exhaust air filter whereby said filter dust bag is positioned upstream of said motor-fan unit and said exhaust air filter is positioned downstream of said motor-fan unit.

4,627,859

FACILITATED GAS ENRICHMENT MEMBRANE COMPOSITES AND A PROCESS FOR THE PREPARATION THEREOF

Joseph J. Zupancic, Bensenville, and Raymond J. Swedo, Mount Prospect, both of Ill., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 15, 1985, Ser. No. 702,172

Int. Cl.⁴ B01D *53/22*

U.S. Cl. 55—158 **22 Claims**

1. A facilitated gas enrichment membrane composite which comprises an organometallic gas carrier interdispersed within an interpenetrating polymer network matrix, said interpenetrating polymer network matrix being comprised of (1) an isocyanate-capped polymer physically entwined with (2) a nitrogen-containing polymer, said component (1) being physically entwined with component (2) by means of a substituted polyurea, said polyurea being formed by the curing of said membrane at a temperature in the range of from about ambient to about 100° C. in an atmosphere which possesses relative humidity in the range of from about 0% to about 100% for a period of time sufficient to generate an amine-capped polymer by the hydrolysis of a portion of said isocyanate-capped polymer, with said amine-capped polymer subsequently reacting with a portion of the isocyanate groups present in said membrane to form a substituted polyurea which serves to physically entwine said component (2) in said membrane, said organometallic gas carrier being interdispersed within said interpenetrating polymer network, capable of reversible reaction with oxygen or other gases and comprising a transition metal complexed with an organic compound selected from the group consisting of porphyrins, phthalocyanines, derivatives thereof and phosphorus complexes.

4,627,860

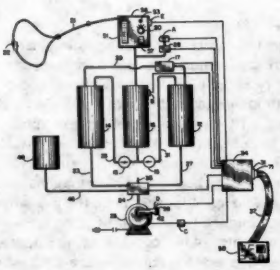
OXYGEN CONCENTRATOR AND TEST APPARATUS

Robert O. Rowland, Hemet, Calif., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Continuation-in-part of Ser. No. 634,595, Jul. 26, 1984, Pat. No. 4,561,287, which is a continuation-in-part of Ser. No. 396,705, Jul. 9, 1982, Pat. No. 4,516,424. This application Mar. 18, 1985, Ser. No. 713,339

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—162 **26 Claims**



1. In an oxygen concentrator comprising

a plurality of molecular sieve beds for alternately receiving atmospheric air for selectively adsorbing nitrogen therefrom to increase the oxygen concentration of an oxygen enriched product gas recovered therefrom,

a reservoir for receiving said product gas from said sieve beds and flow control means for selecting the withdrawal rate of said product gas from said reservoir,

a compressor including means for providing line voltage for operating said compressor, and

a valve cooperating with said compressor for alternately charging said sieve beds with atmospheric air and timing means for switching said valve to alternately charge said sieve beds according to a timing cycle, the improvement comprising

(a) flow rate sensing means independent of said flow control means for sensing the rate of withdrawal of product gas from said reservoir and for communicating the sensed rate of withdrawal of said product gas to a modem,

(b) oxygen sensing means for sensing the oxygen concentration in said oxygen enriched product gas and for communicating the sensed oxygen concentration in said product gas to a modem,

(c) a modem for receiving quantitative signals communicated from said flow rate sensing means and said oxygen sensing means and for transmitting said signals to a remote test apparatus, and

(d) a remote test apparatus in telephonic communication with said modem for receiving transmitted signals from said modem and having means for displaying the flow rate and oxygen concentration of said product gas.

16. In an oxygen concentrator for increasing the oxygen concentration of a gaseous mixture comprising a valve having a first position for charging atmospheric air under pressure from a compressor into a molecular sieve bed and selectively adsorbing nitrogen therefrom to produce an oxygen enriched gaseous product and a second position in which desorbed nitrogen is released from said sieve bed, a reservoir for receiving said gaseous product from said sieve bed and flow control means for selecting the withdrawal rate of said product gas from said reservoir, the improvement comprising:

(a) flow rate sensing means independent of said flow control means for sensing the flow rate of gaseous product withdrawn from said reservoir and means for communicating the sensed flow rate to a microprocessor,

(b) oxygen sensor for sensing the oxygen concentration of said gaseous product and means for communicating the measured oxygen concentration to a microprocessor,

(c) a microprocessor cooperating with said flow rate sensing means and said oxygen sensor for receiving quantitative signals therefrom and memory means for storing the last determined gaseous product flow rate and sensed oxygen concentration, and

(d) a testing apparatus removably connected with said microprocessor having selective digital display means for displaying the gaseous product flow rate and sensed oxygen concentration received from said microprocessor.

4,627,861

OIL SEPARATOR

Yoshiro Ibaraki, Ibaraki; Toshiaki Kawabata, Tokyo; Tsuneo Kan, Ibaraki, and Atsuo Kishi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 352,378, Feb. 25, 1982. This application Apr. 12, 1984, Ser. No. 599,485

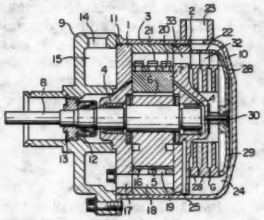
Claims priority, application Japan, Mar. 6, 1981, 56-31325; Dec. 21, 1981, 56-205347

Int. Cl.[4] B01D *45/02, 45/06, 50/00*

U.S. Cl. 55—278 **6 Claims**

1. An oil separator installed in a compressed gas discharge section of a gas compressor to separate oil from exhausted gas containing refrigerant gas and minute particles of oil in the refrigerant gas, the oil separator comprising:

a plurality of grooved plates each formed with a plurality of grooves on opposite surfaces thereof and with openings serving as passageways for the exhausted gas, a blind plate and upper and lower partition wall portions on each plate, said grooved plates being arranged in juxtaposed, spaced apart, parallel relationship, said blind plate being disposed at one end of the plurality of grooved plates, said exhausted gas passageways of each grooved plate being sealingly aligned with passageways of adjacent grooved plates to introduce the exhausted gas therethrough toward said blind plate, said grooves are arranged so as to extend in a substantially vertical direction, said blind plate is disposed outwardly of the grooved plate most remote from the compressor discharge section, said blind plate cooperating with the grooved plates so that the exhausted gas introduced through the gas passageways impinges on



the blind plate and changes direction, said gas passageways are formed in peripheral portions of each of said grooved plates, at least one additional opening is provided in each of the grooved plates in a central area so that the exhausted gas flows through the spaces between adjacent grooved plates substantially at right angles to the grooves, said upper and lower partition wall portions prevent the exhausted gas from flowing parallel to the grooves in the grooved plates, said partition wall portions being substantially at right angles to said grooves, the grooved plates closely contact each other at the upper partition wall portions and have a gap between the lower partition wall portions, whereby the oil can be trapped by the grooved plates and flow along the grooves by gravity through the gap between lower partition wall portions.

4,627,862

AIR CLEANING APPARATUS

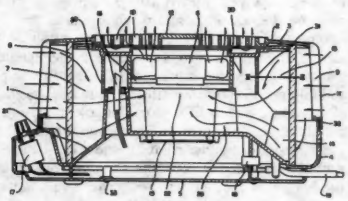
Roland Frei, and Franz Gutmann, both of Rebstein, Switzerland, assignors to Plaston AG, Widnau, Switzerland

Filed Jan. 31, 1985, Ser. No. 696,778

Claims priority, application Switzerland, Feb. 7, 1984, 565/84

Int. Cl.[4] B01D *50/00*

U.S. Cl. 55—316 **6 Claims**



3. An air cleaning apparatus comprising a housing having inlet opening means for admitting air into said housing and outlet opening means for delivering cleaned air therefrom, a motor unit including an axial air circulating fan having an inlet extending about the axis of said axial air circulating fan, and filter means for cleaning the air admitted into said housing, said

housing comprising first and second housing parts defining a chamber therebetween, said motor unit being located in said chamber, each of said first and second housing parts having surface means thereon facing each other and defining an air channel at least partially circumscribing said motor unit and extending about the axis of said axial air circulating fan for conducting air from said inlet opening means to said inlet of said axial air circulating pump, said inlet opening means being arranged on the side of said housing located radially outwardly of said air channel, said outlet opening means being located on the axis of said axial air circulating fan and in an end surface of said housing extending transverse to the axis of said axial air circulating fan, said filter means being in the form of a shell located between said inlet opening means and said air channel in circumscribing relationship relative to said air channel, and said filter shell completely enclosing said air channel, said surface means on said first and second housing parts having air flow conducting surface portions converging toward said axial air circulating fan at least in the vicinity of said inlet.

5. An apparatus as set forth in claim 3 wherein the filter shell is formed of a plurality of layers of which at least one layer contains active carbon and another layer consists of electrostatically charged nonwoven material.

4,627,863

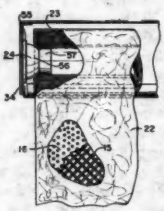
FILTER FOR AIR HANDLING EQUIPMENT

Max Klein, P.O. Box 3, Dalton, N.J. 01226

Filed Jul. 31, 1985, Ser. No. 761,018

Int. Cl.[4] B01D *46/18*

U.S. Cl. 55—354 **15 Claims**



1. For an air-handling housing having a vertically-oriented elongated air flow passage and a support structure in vertical registry with said passage, filter apparatus adapted to use a filter medium in continuous web form wound in a roll on a selected cylindrical core, said core comprising a hollow shell of resilient material having hollow ends, said apparatus comprising a storage chamber mounted on said support structure,

a discharge slot in said chamber adjacent one end of said passage and at least coextensive in width with said passage, and

means in said chamber adapted to mount said roll of filter medium in a position to afford dispensing of said filter medium web through said discharge slot, and

guide means below said discharge slot to slidably receive said filter medium web, said guide means extending from said slot across the entire length of said flow passage to slidably position said web in covering relationship thereto,

said mounting means in said chamber comprising a pair of axially aligned stub shafts fixedly mounted when in operating position against rotation and axial displacement in said chamber and spaced apart a given distance less than the length of the said selected core, and adapted to telescopically engage in the hollow ends of said core, the material of said core and said shafts providing confronting friction surfaces, said stub shafts being of rigid material and having expanding bell-shaped outlines for insertion into the hollow ends of the shell to frictionally engage said expanding outlines with the free ends of the shell, the shape and axial spacing of said shafts in said operating position being selected relative to the shape and axial spacing of said hollow ends of the core so as to produce a frictional drag affording controlled rotation of said roll as said web is dispensed through said slot by manual withdrawal.

4,627,864

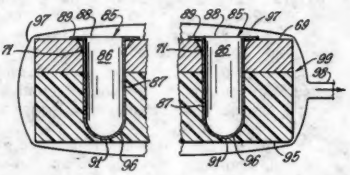
METHOD OF MAKING GLASS FIBER FORMING FEEDERS

Mohinder S. Bhatti, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 9, 1984, Ser. No. 639,177

Int. Cl.[4] C03B *37/08;* **B23K** *35/24*

U.S. Cl. 65—1 **9 Claims**



1. A method of making an orificed discharge wall for supplying a plurality of streams of molten inorganic material to be attenuated into filaments comprising:

inserting elements in apertures in a member;

positioning said elements and member within a precured elastomeric sheath adapted to isostatically transmit pressure to said elements and member;

applying cold isostatic pressure to the sheathed elements and member to mechanically seal the elements to the member; and

fusing the mechanically sealed elements and member together to prevent the unwanted passage of molten glass between said elements and said member, said elements having an orifice to permit the passage of molten glass therethrough to establish said streams.

4,627,865

PROCESS OF MANUFACTURING OPTICAL FIBERS OF EXTREMELY LOW LOSS IN THE MEDIUM INFRARED

Giacomo Roba, Turin, Italy, assignor to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Sep. 12, 1984, Ser. No. 650,296

Claims priority, application Italy, Sep. 15, 1983, 67956 A/83

Int. Cl.[4] C03B *37/018*

U.S. Cl. 65—3.12 **3 Claims**

1. In a process for manufacturing optical fibers of extremely low loss in transmission of infrared radiation, wherein a preform from which the fibers are drawn is made from metal fluoride glass obtained by vapor phase reaction and deposition on a substrate, the improvement wherein said glass is obtained by the reaction between a gaseous reactant containing fluorine and an organometallic compound of the formula

$$M(C_\gamma H_\delta)_\psi A_\eta$$

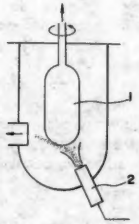
where M represents a metal whose fluoride is to be obtained by reactive synthesis, C is carbon, H is hydrogen, A is a halogen, and symbols γ, δ, ψ, η are all at least equal to one and represent the molecular coefficients of atoms C, H, of group CH and of halogen A respectively.

4,627,866

METHOD FOR PRODUCING OPTICAL FIBER PREFORM

Hiroo Kanamori; Gotaro Tanaka, both of Yokohama, and Kazunori Chida, Mito, all of Japan, assignors to Sumitomo Electric Industries Ltd., Osaka and Nippon Telegraph and Telephone Public Corporation, Tokyo, both of Japan

Filed Dec. 6, 1984, Ser. No. 679,030
Int. Cl.[4] C03B *37/018*
U.S. Cl. 65—3.12 5 Claims



1. A method for producing an optical fiber preform comprising the steps of:

injecting an oxide glass-forming raw material and oxygen gas from a primary nozzle, a gaseous fluorine-containing material and oxygen gas from a first nozzle which surrounds said primary nozzle or is surrounded by said primary nozzle, inert gas from a second nozzle which surrounds said first nozzle and said primary nozzle, and hydrogen gas from a third nozzle which surrounds said second nozzle,

flame hydrolyzing the glass-forming raw material to synthesize glass soot particles,

depositing the glass soot particles on a tip of a rotating seed rod until an optical fiber preform is formed, and

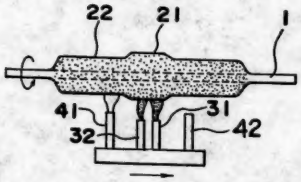
fusing the optical fiber preform to produce an oxide glass optical fiber preform containing fluorine.

4,627,867

METHOD FOR PRODUCING HIGHLY PURE GLASS PREFORM FOR OPTICAL FIBER

Gotaro Tanaka; Hiroo Kanamori, and Futoshi Mizutani, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 4, 1985, Ser. No. 708,051
Claims priority, application Japan, Mar. 7, 1984, 59-43640
Int. Cl.[4] C03B *37/018, 19/06*
U.S. Cl. 65—3.12 1 Claim



1. A method for producing a glass preform for an optical fiber by an outside vapor-phase deposition method, which comprises the steps of:

forming glass soot particles by jetting and combusting gaseous glass-forming raw material and fuel gas from a first burner, in the presence of oxygen,

depositing the particles on a seed rod with control being provided so as to form a soot rod at such a temperature that a specific bulk density $\rho/\rho 0$, wherein ρ is a bulk density of the soot rod and $\rho 0$ is a bulk density of perfectly sintered glass, of the soot rod being formed is from 0.02 to 0.1,

subsequently heating the soot rod by a second burner with control being provided so as to increase the bulk density of the soot rod to from 0.15 to 0.5, and then

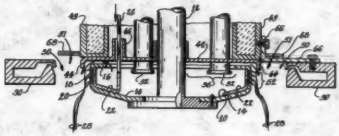
sintering the soot rod to obtain a transparent glass preform for an optical fiber.

4,627,868

METHOD AND APPARATUS FOR PRODUCING MINERAL FIBERS

Farrokh Kaveh, Dublin, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 19, 1985, Ser. No. 767,224
Int. Cl.[4] C03B *37/04*
U.S. Cl. 65—6 11 Claims



9. A method of producing mineral fibers comprising the steps of: flowing molten mineral material into a spinner having an orificed peripheral wall; rotating said spinner forcing the molten mineral material through said orificed wall to form fibers; forcing high velocity air against said fibers by means of a blower mounted circumferentially about said spinner in a spaced apart relationship with said spinner defining a gap between said blower and said spinner; inducing ambient air to flow through said gap by means of said high velocity air and controlling said induced ambient air flow by means of a screen mounted in said gap.

4,627,869

METHOD FOR INHIBITING AXILLARY BUD GROWTH

In-Kook Chang, Painesville, Ohio, assignor to SDS Biotech Corporation, Painesville, Ohio

Filed Jul. 12, 1984, Ser. No. 630,307
Int. Cl.[4] A01N *37/10*
U.S. Cl. 71—78 2 Claims

1. A method for inhibiting the growth and development of buds on plants, which method comprises contacting the plant with an effective amount of dimethyl 2,3,5,6-tetrachloroterephthalate.

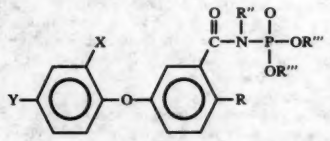
4,627,870

CERTAIN PHENOXY-BENZAMIDO-DIPHENYL-PHOSPHONATE ESTERS HAVING HERBICIDAL ACTIVITY

Sreeramulu Nagubandi, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 25, 1985, Ser. No. 704,988
Int. Cl.[4] C07F *9/24;* A01N *57/28, 57/30*
U.S. Cl. 71—86 6 Claims

1. A diphenyl ether derivative of the formula



and tautomers thereof wherein

X is selected from the group consisting of chlorine, bromine, iodine, fluorine, methyl, cyano or hydrogen;

Y is CF_nH_{3-n} or chlorine, wherein n is an integer from 0 to 3;

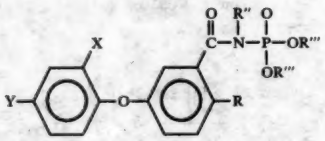
R is selected from the group consisting of nitro, hydrogen or halogen;

R″ is hydrogen, alkyl, phenyl wherein the alkyl group has from 1 to 10 carbon atoms;

R‴ is the same or different and is selected from C_1–C_{10} alkyl, phenyl, or hydrogen; and

agriculturally acceptable salts thereof.

5. A method for controlling undesirable weed pests which comprises applying to the locus where control is desired a herbicidally effective amount of a compound having the formula



and tautomers thereof wherein

X is selected from the group consisting of chlorine, bromine, iodine, fluorine, methyl, cyano or hydrogen;

Y is CF_nH_{3-n} or chlorine, wherein n is an integer from 0 to 3;

R is selected from the group consisting of nitro, hydrogen or halogen;

R″ is hydrogen, alkyl, phenyl wherein the alkyl group has from 1 to 10 carbon atoms;

R‴ is the same or different and is selected from C_1–C_{10} alkyl, phenyl, or hydrogen; and

agriculturally acceptable salts thereof.

4,627,871

HERBICIDAL 2-[4-SUBSTITUTED CARBOXYAMINO-PHENOXY (OR PHENYL MERCAPTO)]-SUBSTITUTED PYRIMIDINES

Klaus Sasse, Bergisch-Gladbach; Ludwig Eue, Leverkusen; Hans-Joachim Santel, Cologne, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

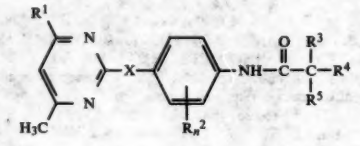
Filed May 24, 1985, Ser. No. 737,977

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422077

Int. Cl.⁴ A01N *43/48*; C07D *239/02*

U.S. Cl. 71—92 **19 Claims**

1. A substituted carboxylic acid anilide of the formula



in which

X represents oxygen or sulphur,

R^1 represents hydrogen, halogen, alkyl with 1 to 6 carbon atoms, trifluoromethyl, phenyl, alkoxy with 1 to 6 carbon atoms, alkylmercapto with 1 to 6 carbon atoms, or phenyl substituted with chlorine, trifluoromethyl and/or methyl,

R^2 represents halogen or methyl,

n represents 0, 1 or 2,

R^3 represents hydrogen, halogen, alkyl with 1 to 6 carbon atoms, alkyl with 1 to 6 carbon atoms, alkyl with 1 to 6 carbon atoms substituted with fluorine, chlorine and/or bromine, phenyl, benzyl, phenyl or benzyl each substituted with fluorine, chlorine, bromine, trifluoromethyl, methoxy and/or methyl, or the radicals —OR^6 or —SO_m—R^6,

wherein

R^6 represents alkyl with 1 to 6 carbon atoms, alkyl with 1 to 6 carbon atoms substituted by fluorine, chlorine and/or bromine, phenyl, or phenyl substituted by fluorine, chlorine, bromine and/or alkyl with 1 to 4 carbon atoms, and m represents 0, 1 or 2, and

R^4 and R^5 independently of one another represent halogen, alkyl with 1 to 6 carbon atoms or alkyl with 1 to 6 carbon atoms substituted by fluorine, chlorine and/or bromine, or

R^4 and R^5, together with the adjacent carbon atom, represent a carbocyclic ring with 3 to 8 ring carbon atoms optionally substituted by fluorine, chlorine and/or alkyl with 1 to 4 carbon atoms.

17. A method of combating weeds, which comprises applying to the weeds, or to their habitat, a herbicidally effective amount of a substituted carboxylic acid anilide as claimed in claim 1.

4,627,872

2,4-DIAMINOPYRIMIDINES

Michael Schwamborn, Cologne; Engelbert Kühle, Bergisch-Gladbach; Ludwig Eue, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach, and Hans-Joachim Santel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

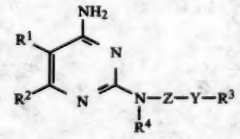
Filed Dec. 5, 1985, Ser. No. 806,053

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445293

Int. Cl.⁴ A01N *43/54*; C07D *239/48*

U.S. Cl. 71—92 **6 Claims**

1. A 2,4-Diaminopyrimidine of the formula



in which

R^1 represents hydrogen or halogen,

R^2 represents optionally halogen-substituted alkyl with 1–6 C atoms, or represents halogen or alkoxy with 1–6 C atoms,

R^3 represents alkyl with 1–6 C atoms,

R^4 represents hydrogen or alkyl with 1–6 C atoms,

Y represents oxygen or sulfur and

Z represents branched or unbranched alkylene with 2 to 10 C atoms.

6. A method of combating weeds comprising applying to said weeds or to the location in which said weeds are growing a herbicidally effective amount of a 2-4-diaminopyrimidine of the formula according to claim 1.

4,627,873

AGRICULTURAL SULFONAMIDES

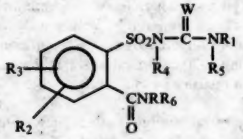
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 480,591, Mar. 30, 1983, Pat. No. 4,545,808, which is a division of Ser. No. 98,781, Nov. 30, 1979, Pat. No. 4,394,506, which is a continuation-in-part of Ser. No. 29,281, Apr. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 15,341, Mar. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 965,070, Nov. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 910,965, May 30, 1978, abandoned. This application Jul. 11, 1985, Ser. No. 753,892

Int. Cl.[4] C07D *251/50, 251/52, 251/44;* A01N *43/70*

U.S. Cl. 71—93 20 Claims

1. A compound selected from



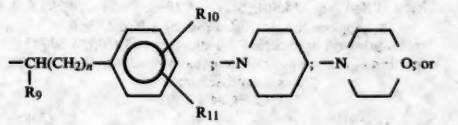
wherein

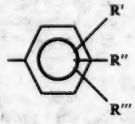
R is hydrogen, C_1–C_{12} alkyl, $(CH_2CH_2O)_{n'''}R_{12}$, $CH_2CH_2CH_2OR_{12}$, C_3–C_{10} alkenyl, C_3–C_6 alkynyl; C_3–C_8 cycloalkyl; C_5–C_6 cycloalkenyl;

R is also C_5–C_8 cycloalkyl substituted with 1 to 3 substituents selected from (a) 0–2 OCH_3 groups, (b) 0–3 CH_3 groups or (c) C_2H_5;

R is also trifluoromethylcyclohexyl, C_4–C_{10} cycloalkylalkyl, C_4–C_8 cycloalkyl substituted with 1–2 CH_3 groups, CH_2CN, CH_2CH_2CN, $C(CH_3)_2CN$, OCH_3, $N(CH_3)_2$;

R is also





n''' is 1, 2 or 3

R_{12} is CH_3, CH_2CH_3, $CH(CH_3)_2$ or phenyl;

n is 0, 1, 2 or 3;

R_9 is H or C_1–C_3 alkyl;

R_{10} is H, C_1–C_3 alkyl, Cl, Br, OCH_3 or OC_2H_5;

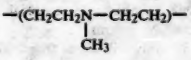
R_{11} is H, C_1–C_3 alkyl, Cl, Br, OCH_3 or OC_2H_5;

R′ is H, C_1–C_4 alkyl, OCH_3, F, Br, Cl, CF_3, CN, NO_2, SO_2CH_3, SCH_3 or $N(CH_3)_2$;

R″ is H, C_1–C_4 alkyl, OCH_3, F, Br or Cl;

R‴ is H, CH_3, Cl, F or Br;

R_6 is H, C_1–C_6 alkyl, allyl, CH_2CN, or CH_2CH_2CN, or R and R_6 may be taken together to form $—(CH_2)_4—$, $—(CH_2)_5—$, $—(CH_2)_6—$, $—(CH_2CH_2OCH_2CH_2)—$ or



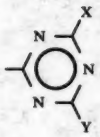
provided that

a. when R is OCH_3, then R_6 is CH_3;

b. when R_6 is CH_2CH_2CN or CH_2CN, then R is CH_2CH_2CN or CH_2CN; and

c. R and R_6 have a total number of carbon atoms less than or equal to 13;

R_1 is



R_2 is H, Cl, Br, F, C_1–C_3 alkyl, NO_2, SO_2CH_3, OCH_3, SCH_3, CF_3, $N(CH_3)_2$, NH_2 or CN;

R_3 is H, Cl, Br, F or CH_3;

R_4 is H or CH_3;

R_5 is H, CH_3 or OCH_3;

W is O or S;

X is H, Cl, CH_3, OCH_3, OCH_2CH_3 or $OCH_2CH_2OCH_3$;

Y is H, F, Cl, Br, C_1–C_4 alkyl, C(O)L, C_1–C_4 alkyl substituted with (a) OCH_3, (b) OC_2H_5, (c) CN, (d) C(O)L or (e) 1–3 atoms of F, Cl or Br;

Y is also C_3–C_4 alkenyl, $CH_2C{\equiv}CR_{13}$, $A(CH_2)_{n'}A_1(C_1$–C_{13} alkyl), $ACH_2C(O)L$, $ACH(CH_3)C(O)L$, ACH_2CH_2-C(O)L, SCN, N_3, $NR_{16}R_{17}$, OR_{14} or SR_{15};

R_{13} is H, CH_3 or CH_2Cl;

n′ is 2 or 3;

A is O or S;

A′ is O, S or SO_2;

L is NH_2, OH, $N(OCH_3)CH_3$, $NH(C_1$–C_4 alkyl), $N(C_1$–C_4 alkyl)$_2$, or C_1–C_6 alkoxy;

R_{16} is H or CH_3;

R_{17} is H, OCH_3, C_1–C_6 alkyl, C_1–C_4 alkyl substituted with (a) CN or (b) C(O)L;

R_{17} is also C_3–C_4 alkenyl, C_3–C_6 cycloalkyl or C_2–C_3 alkyl substituted with (a) OCH_3 or (b) OC_2H_5;

R_{16} and R_{17} may be taken together to form $—CH_2CH_2CH_2CH_2—$ or $—CH_2CH_2OCH_2CH_2—$;

R_{14} is C_1–C_4 alkyl, C_2–C_4 alkyl substituted with 1–3 atoms of F, Cl or Br, C_1–C_4 alkyl substituted with CN, C_3–C_4 alkenyl, $CH_2C{\equiv}CR_{13}$, or

R_{15} is C_1–C_4 alkyl, allyl, propargyl or C_1–C_2 alkyl substituted with CN;

provided that

a. when Y is greater than or equal to 4 carbon atoms, then R is less than or equal to 4 carbon atoms; and

b. when X is Cl, then Y is Cl, and when X and Y are both H, then R is less than or equal to 4 carbon atoms.

17. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,627,874

N-(α,α-DIALKYLBENZYL)-PHENYLACETAMIDE COMPOUNDS AND HERBICIDAL COMPOSITIONS CONTAINING SAID COMPOUNDS

Tetsuo Takematsu; Nobuyuki Kikkawa, both of Utsunomiya, and Hideaki Ogawa, Sodegaura, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

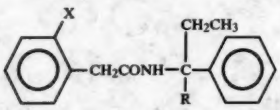
Division of Ser. No. 118,746, Feb. 5, 1980, abandoned. This application Apr. 7, 1982, Ser. No. 366,142

Claims priority, application Japan, Feb. 7, 1979, 54-12211

Int. Cl.[4] A01N *37/18*; C07C *103/22*

U.S. Cl. 71—118 5 Claims

1. N-(α,α-dialkylbenzyl)-phenylacetamide compounds having the general formula



wherein X is a chlorine atom or a bromine atom, and R is a methyl group or an ethyl group.

5. A herbicidal composition comprising (i) a herbicidal carrier, and (ii) a herbicidally effective amount of at least one comound as defined in any one of claims 1, 2, 3 or 4.

4,627,875

RECORDING LIQUID

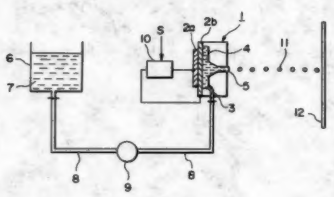
Masatsune Kobayashi; Tsuyoshi Eida; Shoji Koike, all of Yokohama, and Keiko Nakousai, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 647,156, Sep. 4, 1984, abandoned. This application Feb. 10, 1986, Ser. No. 828,590

Claims priority, application Japan, Sep. 12, 1983, 58-168547

Int. Cl.[4] C09D *11/02*

U.S. Cl. 106—22 4 Claims



1. A recording liquid which comprises (1) 0.1 to 20 weight percent C.I. Acid Red 8 as a recording agent for forming an image and (2) a liquid medium comprising at least

(a) 1 to 30 weight percent of a member selected from the group consisting of polyethylene glycol, polyethylene glycol monomethyl ether and a mixture thereof,

(b) 1 to 40 weight percent of a member selected from the group consisting of diethylene glycol, sulfolane and a mixture thereof,

(c) 1 to 40 weight percent of a member selected from the group consisting of N-methyl-2-pyrrolidone, 1,3-dimethyl-2-imidazolidinone and a mixture thereof, and

(d) 10 to 90 weight percent water; said weight percents being based on the total weight of the recording liquid.

4,627,876

PRINTING INK

Werner Fries, Weil der Stadt, and Karl-Wilhelm Klemm, Stuttgart, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 554,625, Nov. 23, 1983, abandoned. This application May 8, 1985, Ser. No. 731,765

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243532

Int. Cl.[4] C09D *11/06*

U.S. Cl. 106—27 14 Claims

1. In a printing ink which is deinkable from printed paper and which consists of pigment, an alkyd resin binder which has been modified with fatty acids having an iodine number below 20,

the improvement comprising said alkyd resin, at least 40% by weight, based on total binder content, comprising an epoxy alkyd resin which has an acid number below 11 and which has been prepared by reacting

(a) a compound selected from the group consisting of fatty acids having 6–20 carbon atoms, triglycerides of said fatty acids, or a mixture of said acids;

(b) a polyol;

(c) an epoxy resin having a molecular weight of 380–2,900, an epoxide equivalent weight of 175 to 2,050 and an ester equivalent weight of 80 to 200; and

(d) a dicarboxylic acid, the proportion of said epoxy resin amounting to 1 to 40 mole percent, based on the total amount of said polyol and said epoxy resin.

4,627,877

METHOD AND APPARATUS FOR CONTINUOUSLY PRODUCING A CEMENT CLINKER

Tadashi Ogawa, 12-10, Miyakubo 2-chome, Ichikawa-shi, Chiba-ken; Shunichiro Ono, 2-10, Kitamachi 4-chome, Kichijoji, Musashino-shi, Tokyo, and Kyoichi Shibuya, 7-6-203, Tsudanuma 3-chome, Narashino-shi, Chiba-ken, all of Japan

Division of Ser. No. 134,461, Mar. 27, 1980, Pat. No. 4,295,823. This application Jul. 30, 1980, Ser. No. 173,604

Claims priority, application Japan, Apr. 3, 1979, 54-39337

The portion of the term of this patent subsequent to Sep. 9, 2002, has been disclaimed.

Int. Cl.[4] C04B *7/02*

U.S. Cl. 106—100 11 Claims

1. An improved method for continuously producing a cement clinker, comprising the steps of:

feeding a cement material into a preheating or calcining region;

preheating or calcining said fed cement material in a predetermined temperature range;

forwarding said preheated or calcined cement material into a heating region;

heating said preheated or calcined cement material at a predetermined temperature to convert said cement material to a cement clinker;

moving said cement clinker into a cooling region;

cooling said cement clinker with cooling air to a decreased temperature, and;

flowing an exhaust gas from said heating region through said preheating or calcining region, which method is characterized by the steps of:

feeding a combustible material into a heat-decomposing region located betwen said heating region and said preheating or calcining region;

introducing at least a portion of said exhaust gas from said heating region into said heat-decomposing region to heat-decompose said combustible material and to generate a combustible gas therefrom;

introducing said combustible gas from said heat-decomposing region into said preheating or calcining region, and;

burning said combustible gas in said preheating or calcining region to preheat or calcine said cement material.

4,627,878

METHOD OF PRODUCING POROUS MAGNESIA CLINKER

Hiroshi Hagiwara, Urawa; Masaru Shirasaka, Tokyo, and Tsunenori Moriyama, Nagasaki, all of Japan, assignors to Onoda Cement Co., Ltd., Yamaguchi and Omura Refractories Co., Ltd., Nagasaki, both of, Japan

Filed Apr. 11, 1984, Ser. No. 599,068

Claims priority, application Japan, Apr. 14, 1983, 58-64591

Int. Cl.[4] C04B *3/00*

U.S. Cl. 106—121 2 Claims

1. A method for producing a porous magnesia clinker comprising the steps of

(a) admixing a magnesia material having a grain size of less than about 0.1 mm with from about 10 to 60 percent by weight of the mixture of fluid oil coke having a grain size of about 1 mm or less;

(b) calcining the resulting mixture at a temperature of from about 900° C. to 1,600° C. for a time sufficient to burn off said coke and thereby to form pores in said magnesia material, and

(c) firing the resulting product at a temperature of from about 1600° C. to 2,030° C. to produce porous magnesia clinker.

4,627,879

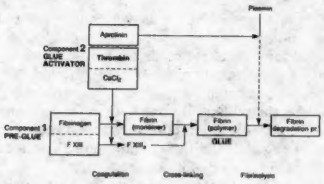
FIBRIN ADHESIVE PREPARED AS A CONCENTRATE FROM SINGLE DONOR FRESH FROZEN PLASMA

Eric Rose, Palisades, N.Y., and Arthur Dresdale, Plainfield, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation-in-part of Ser. No. 648,752, Sep. 7, 1984, abandoned. This application Jan. 3, 1985, Ser. No. 688,601

Int. Cl.[4] A61B *17/04;* A61F *13/00;* A61K *37/00;* C08L *89/00*

U.S. Cl. 106—124 21 Claims



1. A method of preparing a fibrin glue useful in surgical procedures which comprises:

(a) preparing a cryoprecipitated suspension containing fibrinogen and Factor XIII by freezing fresh frozen plasma from a single donor which has been screened for blood transmitted diseases at about −80° C. for at least about 6 hours, raising the temperature of the frozen plasma so as to form a supernatant and a cryoprecipitated suspension containing figrinogen and Factor XIII, and recovering the cryoprecipitated suspension;

(b) applying a defined volume of the suspension to a desired site; and

(c) applying a composition containing a sufficient amount of thrombin to the site so as to cause the fibrinogen in the suspension to be converted to the fibrin glue which then solidifies in the form of a gel.

4,627,880

UNPROCESSED COMPLETE CANE SUGAR AND METHOD OF PRODUCING IT

Arnold Langen, Elsdorf; Herta Benecke, Frechen-Grefrath, and Udo Breithaupt, Kerpen-Horrem, all of Fed. Rep. of Germany, assignors to Pfeifer & Langen, Cologne, Fed. Rep. of Germany

Filed Feb. 27, 1985, Ser. No. 706,534

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407364

Int. Cl.[4] F24C *5/00*

U.S. Cl. 127—43 11 Claims

1. A method of producing substantially complete cane sugar from sugarcane juice, consisting essentially of pressing sugarcane to squeeze out only up to about 50% of the sugarcane juice contained therein, the juice having a sucrose content of more than 20% by weight and more than 90% sucrose in terms of the total solids content, rapidly heating the juice to a pasteurizing temperature of 65° to 80° C. for 5 to 15 minutes, which temperature is above the second flocculation point and below the third flocculation point of the waxes, fats, proteins, and pentosans, separating the flocculate, thickening the remaining juices at a maximum temperature of 60° C. to form a syrup, and rapidly extracting the residual water from the syrup thereby to form a dry and pourable product.

4,627,881

COLD ROLLED STEEL SHEET HAVING EXCELLENT PRESS FORMABILITY AND METHOD FOR PRODUCING THE SAME

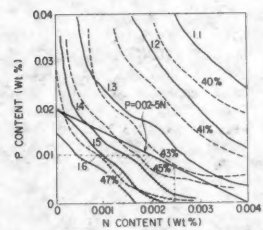
Tsuyoshi Kawano; Shiroh Sanagi, and Koe Nakajima, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 591,902, Mar. 21, 1984, abandoned, which is a continuation of Ser. No. 419,055, Sep. 16, 1982, abandoned. This application Sep. 16, 1985, Ser. No. 776,097

Claims priority, application Japan, Sep. 18, 1981, 56-146348; Sep. 18, 1981, 56-146349

Int. Cl.[4] C21D *7/02, 7/13, 7/14*

U.S. Cl. 148—12 C 8 Claims



1. A method for producing a cold rolled steel sheet having press formability, which comprises:

hot rolling, at a temperature of at least 850° C., and Al-killed, boron-free steel consisting of, by weight, not more than 0.07% C, 0.10–0.40%Mn, 0.010–0.050% Al, not more than 0.0020%N, not more than 0.010%P, and not more than 0.02%Si, wherein the relation between P and N is such that $P+5N \leqq 0.0175\%$, the remainder of the steel being Fe and unavoidable impurities,

cold rolling the hot rolled steel at a reduction of at least 50%, and

subjecting the cold rolled steel to recrystallization continuous annealing at a temperature between the recrystallization temperature and the A_3 point for not longer than five minutes.

4,627,882

METHOD OF MAKING A ROTARY DRILL BIT

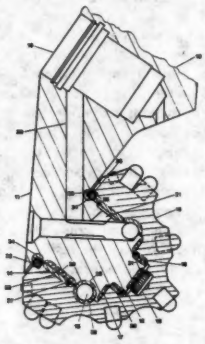
Gunnar T. Söderström, Nickelgatan, Sweden, assignor to Santrade Limited, Lucerne, Switzerland

Division of Ser. No. 442,005, Nov. 16, 1982. This application Apr. 26, 1985, Ser. No. 727,789

Claims priority, application Sweden, Dec. 15, 1981, 8107488

Int. Cl.[4] C21D *1/09*

U.S. Cl. 148—14 9 Claims



1. A method of making a rotary drill bit comprising forming cooperating friction bearing surfaces on a bearing pin and a roller cutter rotatably carried thereon, the bearing surface of the roller cutter being integral with said cutter and being made by tough-hardening an annealing resistant steel alloy having a carbon percentage exceeding 0.30 comprising surface-hardening the bearing surface of the roller cutter by means of a thermal hardening method, providing said bearing surface of said roller cutter with an inlay of a solid lubricant, and applying a wear resistant material on the bearing surface of the bearing pin in at least a lower load bearing fraction thereof, said wear resistant material having higher wearability than the surface-hardened bearing surface of the roller cutter.

4,627,883

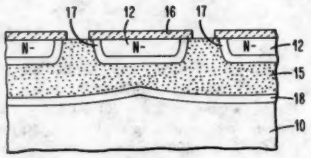
METHOD OF FORMING AN ISOLATED SEMICONDUCTOR STRUCTURE

Roger P. Holmstrom, Wayland, and Jim-Yong Chi, Bedford, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 1, 1985, Ser. No. 718,254

Int. Cl.[4] H01L *21/38, 21/465*

U.S. Cl. 148—187 14 Claims



1. The method of producing a semiconductor integrated circuit structure comprising

providing a body of single crystal silicon having a layer of P-type conductivity or of N-type conductivity of low resistivity with a plurality of regions of N-type conductivity of high resistivity inset in said layer at a surface thereof, each of said regions being surrounded by silicon of said layer except at said surface and having an interface with the silicon of said layer;

converting silicon of said layer contiguous with the interfaces with said regions to porous silicon;

diffusing conductivity type imparting material through the porous silicon into portions of said regions contiguous with said interfaces to alter the electrical characteristics thereof; and

oxidizing portions of the porous silicon contiguous with said interfaces to form insulating material electrically isolating each of said regions.

4,627,884

METHOD OF AND APPARATUS FOR APPLYING LOOPED RUBBER MEMBER ONTO TIRE BUILDING DRUM

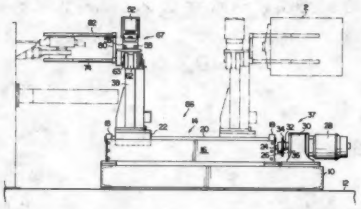
Yusuke Araki, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Mar. 5, 1985, Ser. No. 708,814

Claims priority, application Japan, Mar. 15, 1984, 59-49926

Int. Cl.[4] B29D *30/32*

U.S. Cl. 156—131 13 Claims



1. A method of applying a looped rubber member from a looped member forming machine onto a collapsible tire building drum having grooves formed in the periphery thereof, comprising the steps of

inserting at least two pairs of retaining members in a first direction into said looped rubber member depending from the looped member forming machine;

retaining said looped rubber member on said retaining members from the looped member forming machine;

rotating said retaining members with said looped rubber member retained thereon toward the collapsible tire building drum to a second direction which is opposite to said first direction;

forming said looped rubber member on said retaining members into a substantially circular configuration;

transferring said substantially circular looped rubber member toward the collapsible tire building drum into a first position in which the center of the looped rubber member is in axial alignment with the longitudinal center axis of the collapsible tire building drum;

further transferring said substantially circular looped rubber member from said first position into a second position in which said looped rubber member surrounds the periphery of the collapsible tire building drum radially contracted;

receiving said retaining members in the grooves in the periphery of the collapsible tire building drum;

applying said substantially circular looped rubber member onto the periphery of the collapsible tire building drum; and

withdrawing said retaining members from the grooves in the periphery of the collapsible tire building drum.

7. An apparatus for applying a looped rubber member from a looped member forming machine onto a collapsible tire building drum having grooves formed in the periphery thereof, comprising

at least two pairs of retaining members for retaining the looped rubber member thereon from the looped member forming machine;

retaining member driving means having said retaining members mounted thereon and adapted for driving one pair of the retaining members of said two pairs to move toward and away from each other and the other pair of the retaining members to move angularly with respect to said one pair of the retaining members;

support member for supporting said retaining member driving means thereon;

support member rotating means mounted on said support member and adapted for rotating said support member about the center of the support member;

carrier plate having said support member rotatably mounted thereon;

carrier plate driving means having said carrier plate mounted thereon and adapted for driving said carrier plate to move vertically toward and away from the collapsible tire building drum;

slide block having said carrier plate driving means mounted thereon; and

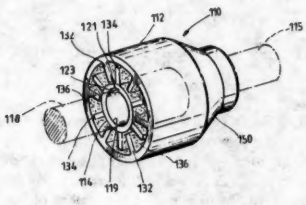
slide block driving means having said slide block threadably mounted thereon and adapted for driving said slide block to move horizontally toward and away from the tire building machine.

4,627,885

METHOD OF PRODUCING A COMPRESSION LOADED TORSIONAL COUPLING DEVICE

Edward J. Arlt, Arlington, Tex., assignor to LTV Energy Products Company, Houston, Tex.

Filed Nov. 17, 1983, Ser. No. 552,823
Int. Cl.[4] B32B *31/14*
U.S. Cl. 156—160 **3 Claims**



1. A method of producing a compression loaded torsional coupling device comprising the steps of:

a. positioning a first coupling member, axially mountable on the end of a powered shaft, in spaced relationship from a second coupling member, axially mountable on the end of a driven shaft, so that each fin of a plurality of fins, mounted on the first coupling member in spaced radial configuration about the axis of rotation of the coupling, is positioned between adjacent fins of a like number of fins, mounted on the second coupling member in spaced radial configuration about the axis of rotation of the coupling, the fins of the first coupling member being positioned in spaced relationship from the second coupling member, the fins of the second coupling member being positioned in spaced relationship from the first coupling member;

b. placing inserts in the spaces between one coupling member and the opposed fins of the other coupling member in alternate gaps between adjacent fins;

c. molding elastomeric material into the alternate gaps between adjacent fins to substantially fill the alternate gaps;

d. curing and cooling the elastomeric material during which the elastomeric material is bonded to the fins;

e. removing the inserts;

f. applying a torque to rotate the coupling member with respect to each other to compress the elastomeric material;

g. placing inserts in the spaces between one coupling member and the opposed fins of the other coupling member in the remaining alternate gaps;

h. molding elastomeric material into the remaining alternate gaps to substantially fill the remaining alternate gaps;

i. curing and cooling the elastomeric material during which the elastomeric material is bonded to the fins;

j. removing the inserts from the remaining alternate gaps; and

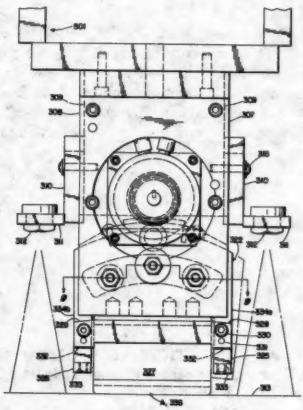
k. releasing the torque.

4,627,886

COMPOSITE TAPE LAYING MACHINE WITH PIVOTING PRESSER MEMBER

Robert J. Grone, Elsmere, Ky., and Michael N. Grimshaw, Loveland, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed May 30, 1985, Ser. No. 739,359
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—361 **9 Claims**



1. In a laminating machine of the type having a head with presser member that presses a strip of material against a contoured surface to apply it to the surface along a path, the machine including means for mounting the head for pivotal movement about the path and where the head and presser member are aligned along a common line substantially normal to the path and passing through a point on the path, apparatus for mounting the presser member for pivotal movement about the path, said apparatus comprising:

arcuate cam means for connecting the presser member to the head and for allowing pivotal movement of the presser member about an axis parallel to said path and passing through said point, the presser member pivotal movement being independent of the head pivotal movement; and

means for realigning the head with the presser member after said member is pivoted about said axis.

4,627,887

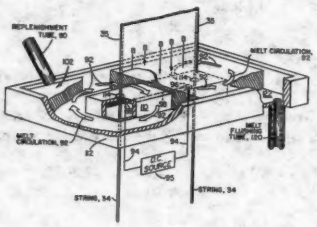
MELT DUMPING IN STRING STABILIZED RIBBON GROWTH

Emanuel M. Sachs, 42 Old Middlesex Rd., Belmont, Mass. 02178

Continuation of Ser. No. 214,741, Dec. 11, 1980, abandoned, Continuation-in-part of Ser. No. 109,865, Jan. 7, 1980, abandoned. This application Nov. 5, 1982, Ser. No. 439,603
Int. Cl.[4] C30B *15/00*
U.S. Cl. 156—608 **8 Claims**

1. In a process in which a ribbon of crystal is grown from a body of melt at a growth interface, with string stabilization

being employed at the edges of said ribbon, a method for minimizing the introduction of impurities from said melt to said crystal grown therefrom comprising: reducing build-up of impurities in the body of the melt due to impurity segregation at the growth interface during crystal growth by continually replenishing the melt with new raw material, and dumping and



completely removing a fraction of molten material from said body of melt continually during the crystal growth process, said fraction being removed at a rate less than the rate of addition of new raw material such that the concentration of impurities in said body of melt and therefore in the growth crystal is reduced during crystal growth, in an open loop process.

4,627,888

CAUSTICIZING METHOD

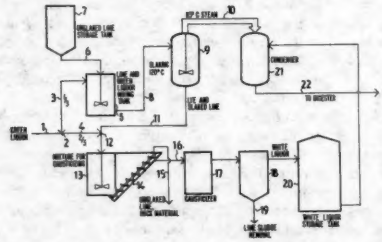
Holger Engdahl, Savonlinna, Finland, assignor to Enso-Gutzeit Oy, Helsinki, Finland

Filed Feb. 22, 1984, Ser. No. 582,455

Claims priority, application Finland, Feb. 23, 1983, 830606

Int. Cl.⁴ C01F *5/24*

U.S. Cl. 162—30.11 **4 Claims**



1. A causticizing method for producing white liquor and lime sludge from soda lye and unslaked lime using a lime slaking process which is carried out under pressure, followed by a causticizing reaction which is carried out under normal atmospheric pressure, and using the heat released from the lime slaking for heating purposes, wherein the soda lye to be causticized is divided into two parts, one of which is used for the slaking of lime by adding to it all the unslaked lime needed for the causticizing process and is, at most, one half of the total amount of lye to be causticized, and after slaking, bringing the two volumes together for the causticizing reaction involving the total amount of lye used.

4,627,889

PROCESS FOR SIZING PAPER WITH ANIONIC HYDROPHOBIC SIZING AGENTS AND CATIONIC RETENTION AIDS

Michael Bernheim, Arlesheim; Hubert Meindl, Riehen; Peter Rohringer, Schönenbuch; Hans Wegmüller, Riehen, and Dieter Werthemann, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 23, 1983, Ser. No. 497,307

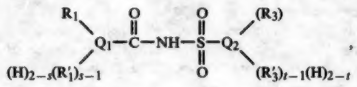
Claims priority, application Switzerland, Mar. 30, 1983, 1757/83

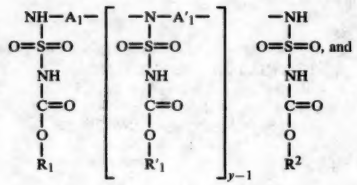
Int. Cl.⁴ D21H *3/12*

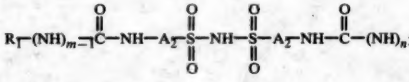
U.S. Cl. 162—158 **7 Claims**

1. A process for sizing paper or cardboard, which comprises adding to an aqueous dispersion of cellulose fibers

(A) A sizing agent which contains a compound selected from the group consisting of







in which R_1, R'_1 and R_2 are each alkyl or alkenyl having 6 to 22 carbon atoms, R_3 and R'_3 are alkyl or alkenyl of 6 to 22 carbon atoms, phenyl or methyl-substituted phenyl, s and t each is 1 or 2, A_1 and A'_2 is ethylene or propylene, A_2 is phenyl or halophenyl, C_1–C_4-alkyl-phenyl or C_1–C_4-alkoxy-phenyl, Q_1 is —O—, —NH— or —N<, Q_2 is —NH— or —N<, and m and n are each 1 or 2, s and t being 2 if Q_1 and Q_2 are —N<, y is an integer form 1 to 5 and

(B) a polymeric cationic retention aid;

and forming said paper or cardboard from said aqueous dispersion of cellulose fibers, sizing agent and cationic retention aid.

4,627,890

CENTRIFUGAL DEVICE

John E. Porter, Newcastle upon Tyne, and Colin Ramshaw, Norley, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 22, 1982, Ser. No. 443,731

Claims priority, application United Kingdom, Nov. 24, 1981, 8135406

Int. Cl.⁴ B01D *3/30*; F28D *9/00*

U.S. Cl. 202—235 **6 Claims**

1. In a centrifugal mass transfer device comprising a rotary fluid-permeable element formed as an annulus about its axis rotation, the improvement comprising:

at least one annular plate which is thin in the direction of said axis, has two opposite surfaces, is made of a heat conductive material and is mounted adjacent a cylindrical face of said permeable element with one said surface of said plate in fluid transfer communication with said adjacent face of said permeable element and the other said surface isolated

from fluid transfer communication with said adjacent face of said permeable element;

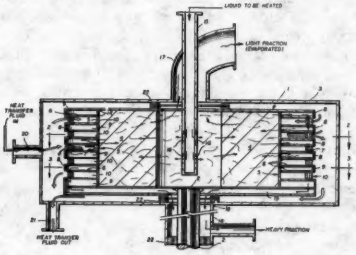
and means to supply a heat transfer fluid to said other surface of each said plate while isolating such fluid from direct contact with said one surface of each said plate.

6. A distillation device comprising:

a rotary permeable element formed as an annulus about its axis of rotation and having a radially inner face and a radially outer face;

condensing means which

(a) is in the form of a plurality of annular plates, mounted in parallel, axially spaced relationship adjacent the radially inner face of said rotary permeable element, each of said annular plates being thin in the direction of the said axis and being made of a heat conductive material, alternate spaces between said plates being in fluid flow communication with said adjacent radially inner face such that vapour discharged through said adjacent radially inner face flows into said alternate spaces but



other spaces between said plates being isolated from fluid flow communication with said adjacent radially inner face, and

(b) is provided with means to supply a heat transfer fluid to said other spaces beween said plates where it absorbs heat while isolating said heat transfer fluid from fluid flow communication with said alternate spaces,

(i) which heat is lost by a portion of the said vapour in the said alternate spaces as it liquifies forming a liquid at least some of which flows from said alternate spaces into said permeable element and

(ii) which heat passes through the thickness of said annular plates to the heat transfer fluid;

vapourising means to vapourise liquid discharged from the radially outer face of the permeable element;

means to supply a fluid feedstock for said distillation to said rotary permeable element; and

means to remove a lighter product fraction and a heavier product fraction from the device.

4,627,891

METHOD OF GENERATING ELECTRICAL AND MAGNETIC FIELDS IN SALT WATER MARINE ENVIRONMENTS

Henry F. Gibbard, Schaumburg, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 660,242, Oct. 11, 1984, which is a continuation of Ser. No. 487,791, Apr. 22, 1983, abandoned, which is a continuation-in-part of Ser. No. 372,785, Apr. 28, 1982, abandoned. This application Aug. 21, 1985, Ser. No. 768,022

Int. Cl.[4] C25B *11/10*

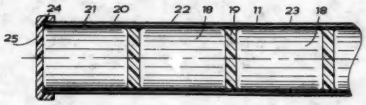
U.S. Cl. 204—1 R **40 Claims**

1. The method of generating electrical and magnetic fields in salt water marine environments comprising the steps of:

providing a first electrode adapted to be trailed in a salt water marine environment;

providing a buoyant, flexible, electrically conductive sweep cable adapted to be trailed in said salt water marine environment;

providing at least one dimensionally stable second electrode helically wound on an elongted, flexible floatation means provided on the distal end of said sweep cable, said floatation means being buoyant when wound with said second electrode, said second electrode having a conductive core, a protective layer of titanium, and a current carryiing outer layer consisting essentially of a conductive material selected from the group consisting of ruthenium dioxide,



iridium oxide, and mixtures of ruthenium oxide and tin oxide in an effective amount for preventing rapid deterioration of said second electrode when employed in salt water marine environments;

trailing said electrodes in spaced relationship to one another in said salt water marine environment; and

applying a preselected voltage between said electrodes causing a high current flow there between, said current flow having current density of at least about 50 mA/cm^2 at said electrode surfaces.

4,627,892

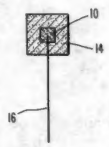
ELECTROCHEMICAL SENSORS AND METHODS FOR THEIR MANUFACTURE AND USE

Wayne L. Worrell, Narberth, and Qing-Guo Liu, Philadelphia, both of Pa., assignors to University Patents, Inc., Norwalk, Conn.

Filed Feb. 22, 1985, Ser. No. 704,385

Int. Cl.[4] G01N *27/58*

U.S. Cl. 204—1 T **39 Claims**



1. An electrochemical sensor for a species comprising:

a shaped body isostatically formed from a blend, said blend comprising a solid solution having a fluorite crystal structure comprising:

a metal oxide;

admixed with said metal oxide, an oxide of an element from group IIA or IIIB of the periodic table in an amount sufficient to render said blend ionically conductive: and

a reference electrode composition substantially completely contained within the shaped body;

said shaped body having not been subjected to thermal densification.

21. A method of monitoring the concentration of a species in a metallurgical melt comprising contacting said melt with the electrochemical sensor of claim 1 or 18.

22. A method of fabricating an electrochemical sensor for a species comprising:

selecting a metal oxide;

admixing with said metal oxide, an oxide of an element from groups IIA or IIIB of the periodic table of the elements to

form a blend in an amount sufficient to render said blend ionically conductive;

providing reference electrode composition; and

isostatically forming said blend into a shaped body substantially surrounding said reference electrode composition;

said, shaped body not being subjected to thermal densification.

4,627,893

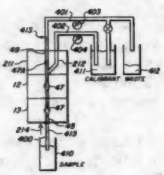
MEANS AND METHODS FOR QUANTITATIVE DETERMINATION OF ANALYTE IN LIQUIDS

Alan D. Cormier, Newburyport, Mass., and Melvin S. Weinberg, Nashua, N.H., assignors to AMDEV, Inc., Danvers, Mass.

Filed Mar. 28, 1984, Ser. No. 594,246

Int. Cl.[4] G01N *27/30, 27/38*

U.S. Cl. 204—1 T **19 Claims**



1. A testing module unit dimensioned and arranged to be used with at least one other module unit in an arrangement for testing an analyte in a liquid,

said module unit having a body and a narrow diameter through passageway,

said passageway having an enlarged chamber intermediate ends of said passageway, said chamber being formed on one side by a membrane of an electrode,

said chamber lying substatially in a plane with a first portion of said passageway opening into an inlet of said chamber at an angle to said plane to cause turbulence substantially confined to said opening while permitting smooth flow beyond said opening whereby said chamber acts as a defuser at its entrance and as a nozzle at an exit thereof,

said chamber inlet having an opposed outlet with said chamber varying in cross section from said opening to exit,

said varying cross section being enlarged toward the center of the chamber and restricted at said exit in a generally diamond shape,

said passageway having a cross-sectional area corresponding to a diameter of from 0.015 inch to 0.05 inch,

said chamber having a maximum cross-sectional area less than ten times the cross-sectional area of said passageway.

3. An electrode holder for use in a testing module unit,

said electrode holder comprising an elongated electrode body having a source of electricity connected therethrough to an internal electrode lying within a first chamber therein,

said first chamber being elongated and open to a second chamber underlying a chemically sensitive ion testing membrane,

said second chamber being filled with a gelatinous electrically conductive material and said first chamber being filled with an electrically conductive liquid whereby there is electrical continuity between said internal electrode and said testing membrane.

8. A method of determining the ionic activity of a fluid by passing said fluid in a stream between a first measuring electrode and a second measuring reference electrode,

said first measuring electrode comprising a portion of a sampling chamber, said first measuring electrode having a membrane with a gel of electrically conductive material underlying the membrane and interspersed between it and an internal electrode portion surrounded by a conductive fluid,

and measuring the electromotive force between said reference electrode and said measuring electrode.

17. A method of cleaning and calibrating a first sampling measuring chamber contained in a modular measuring chamber unit which unit is positioned adjacent a second modular unit containing a reference electrode second chamber,

wherein said units define a passageway between said chambers and through said units,

a second one-way valve passageway intersecting said passageway between said reference electrode second chamber and said sampling measuring chamber, said method comprising

passing a liquid sample through said passageway from said sampling measuring chamber to said reference chamber whereby a measurement of electrical potential can be taken between said chambers while maintaining said second passageway filled with a second fluid other than said sample,

reversing fluid flow between said reference chamber and sampling measuring chamber by passing a cleaning fluid from said reference chamber through said sampling measuring chamber to remove the sample fluid while maintaining said second passageway filled with a fluid,

passing a cleansing fluid flow through said secondary passageway to said sampling measuring chamber without said last-mentioned flow first passing to said reference chamber,

and reversing flow again to pass a calibrant fluid from said sampling chamber to said reference chamber while said secondary passageway maintains a stationary fluid whereby a calibration measurement can be made to measure electrical potential between said sampling chamber and said reference chamber.

4,627,894

METHOD OF MANUFACTURING A BODY MOLDED FROM A PLASTICS MATERIAL AND COVERED WITH A METALLIC LAYER

Michel J. Monnier, Montgeron, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 31, 1984, Ser. No. 645,896

Claims priority, application France, Sep. 7, 1983, 83 14254

Int. Cl.[4] C25D *1/20*

U.S. Cl. 204—4 **8 Claims**

1. A method of manufacturing a molded body of plastic material covered with a metallic layer, comprising the steps of:

(a) electrolytically depositing the metallic layer on a passivated inner surface of a metallic mold, said passivated inner surface forming a uniform intermediate layer of a composition to which the deposited metallic layer has poor adhesion;

(b) introducing the plastic material into the mold to form the moulded body; and

(c) after the plastic material hardens, bringing the mould and the molded body to respective temperatures at which said body and the metallic layer adhering thereto separate from the mold.

4,627,895

MANUFACTURING PROCESS FOR A PLATED CARBONIZED RESIN-COATED PAPER STRUCTURE

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Continuation-in-part of Ser. No. 738,401, Apr. 1, 1986. This application Mar. 21, 1986, Ser. No. 842,300

Int. Cl.[4] C25D *5/54*

U.S. Cl. 204—20 **4 Claims**

1. A process for forming metallic structures out of shapes made of paper comprising the steps of:

forming said paper into a desired shape;

coating said paper with a carbonizable resin;

saturating said paper with said resin;

curing said resin;

baking said cured resin-saturated structure in an inert atmosphere;
carbonizing said resin by said baking step; and
plating said carbon structure with a metallic plating.

4,627,896

METHOD FOR THE APPLICATION OF A CORROSION-PROTECTION LAYER CONTAINING PROTECTIVE-OXIDE-FORMING ELEMENTS TO THE BASE BODY OF A GAS TURBINE BLADE AND CORROSION-PROTECTION LAYER ON THE BASE BODY OF A GAS TURBINE BLADE

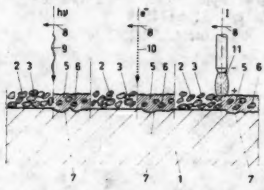
Mohamed Nazmy, Gebenstorf, and Robert Singer, Untersiggenthal, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jan. 27, 1985, Ser. No. 749,547

Claims priority, application Switzerland, Jul. 16, 1984, 3455/84

Int. Cl.⁴ C25D *5/50*

U.S. Cl. 204—37.1 **10 Claims**



1. A method for applying a corrosion protection layer to a base body of a gas turbine blade, which comprises
applying to said base body, silicon carbide particles together with a superalloy material in the form of particles or layers which forms a metallic matrix of the protective layer,
compacting, pressing, and welding or fusing said matrix-forming material such that the protective layer matrix is firmly bonded to said base body, wherein silicon carbide particles are at least partially embedded in the form of fine particles which negligibly protrude above the surface of said protective layer matrix, and said silicon carbide particles partially react with said matrix-forming material so that some silicon migrates into said matrix.

4,627,897

PROCESS FOR THE ELECTROLYSIS OF LIQUID ELECTROLYTES USING FILM FLOW TECHNIQUES

Karl-Heinz Tetzlaff, Kelkheim; Dieter Schmid, Schwalbach, and Jürgen Russow, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 17, 1985, Ser. No. 692,306

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401637

Int. Cl.⁴ C25B *1/00, 3/00*; C25C *1/00*

U.S. Cl. 204—59 R **8 Claims**

1. A process for the electrolysis of liquid electrolytes in which gas bubbles are formed in the electrolyte, in electrolytic cells which are non-partitioned or partitioned by at least one separator and in which at least one electrode is perforated, which comprises causing the electrolyte to flow by means of gravity through the electrolytic cell in such a manner that a gas space is formed laterally to the main direction of flow of the electrolyte.

4,627,898

ELECTROLYTIC PRODUCTION OF PRASEODYMIUM

Mohammad H. Ghandehari, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sep. 7, 1984, Ser. No. 648,722

Int. Cl.⁴ C25C *3/34*

U.S. Cl. 204—64 R **10 Claims**

1. A method for preparing praseodymium metal by electrolyzing praseodymium oxide in a molten electrolyte comprising lithium fluoride and praseodymium fluoride, wherein an initial weight ratio of lithium fluoride to praseodymium fluoride is about 0.1 to about 0.4, and collecting said praseodymium metal at temperatures at or above the melting point of the metal.

4,627,899

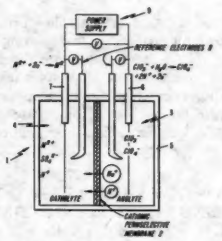
ELECTROLYTIC CELL AND METHODS COMBINING ELECTROWINNING AND ELECTROCHEMICAL REACTIONS EMPLOYING A MEMBRANE OR DIAPHRAGM

Gerald R. Smith, Columbia, and William R. Thompson, Wheaton, both of Md., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 15, 1985, Ser. No. 702,201

Int. Cl.⁴ C25B *1/24*; C25C *1/06, 1/10, 1/00*

U.S. Cl. 204—95 **11 Claims**



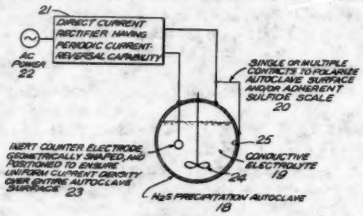
1. A process for combining at compatible cell geometries and current densities the electrowinning of a free metal element on a cathode in a catholytic electrolyte in a cell in which there is an anode with an anolytic electrolyte with a cationic permselective membrane between the catholytic electrolyte and anolytic electrolyte thereby forming a catholytic half-cell compartment and an anolytic half-cell compartment, where the voltage for the combined catholytic half-cell and anolytic half-cell is reduced greater than 50% as compared to the sum of the cell voltages of two independently operating nonmembrane cells using an electrolyte selected from the catholytic electrolyte or the anolytic electrolyte and with water electrolysis at the anode, comprising:
(a) introducing a metal sulfate salt into said catholytic electrolyte in said half-cell catholytic compartment
(b) introducing an alkali metal chlorate and an alkali metal perchlorate into said anolytic electrolyte in said half-cell anolytic compartment; and
(c) applying an electromotive force across said cathode and anode whereby an oxidation electrochemical reaction occurs at the anode to produce a perchlorate while the free metal element of said metal salt is deposited at said cathode.

4,627,900

ELECTROCHEMICAL DISSOLUTION AND CONTROL OF NICKEL SULFIDE SCALE

William G. Sherwood; Paul B. Queneau, both of Golden; Jean-Paul Duterque, Arvada, and Donald R. Hodges, Denver, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Aug. 27, 1982, Ser. No. 412,056
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—147 7 Claims


21
DIRECT CURRENT RECTIFIER HAVING PERIODIC CURRENT REVERSAL CAPABILITY
AC POWER 22
SINGLE OR MULTIPLE CONTACTS TO POLARIZE AUTOCLAVE SURFACE AND/OR ADHERENT SULFIDE SCALE 20
25
CONDUCTIVE ELECTROLYTE 19
24
INERT COUNTER ELECTRODE GEOMETRICALLY SHAPED AND POSITIONED TO ENSURE UNIFORM CURRENT DENSITY OVER ENTIRE AUTOCLAVE SURFACE 23
H2S PRECIPITATION AUTOCLAVE 18

1. A method for electrochemically minimizing scale buildup of metal sulfide on the surface of an acid solution-resistant metal precipitation vessel, wherein said solution-resistant vessel is an autoclave formed of an electrochemically polarizable or film-forming metal, and wherein said metal sulfide is precipitated from a sulfuric acid solution containing metal sulfate by adding a sulfide-precipitating agent thereto, said method comprising,

forming an electrical circuit between said autoclave and an inert electrode immersed in metal sulfate acid solution contained in said vessel,

passing a direct current from said autocalve as the anode through said solution to said inert electrode in said solution such that anodically NiS is converted to $S^{\circ}+Ni^{2+}+2e-$,

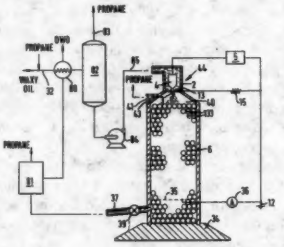
and periodically reversing said current flow at predetermined intervals such that during cathodic treatment $NiS^{\circ}+2H^{+}+2e-$ is converted to $Ni^{\circ}+H_2S$ and during anodic treatment Ni° is converted to $Ni^{2+}+2e-$, the periodic reversal being repeated for a time sufficient to minimize build-up of sulfide scale on the surface of said autoclave during sulfide precipitation.

4,627,901

SEPARATING WAX FROM HYDROCARBON MIXTURE BOILING IN THE LUBRICATING OIL RANGE

Douglas G. Ryan, Rockaway; Anthony E. Cerkanowicz, Livingston; Robert J. L. Chimenti, Short Hills, and Donald J. Mintz, Summit, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 11, 1985, Ser. No. 722,160
Int. Cl.[4] B03C *5/00, 5/02*
U.S. Cl. 204—190 56 Claims



1. A method of pretreating a hydrocarbon oil mixture boiling in the lubricating oil range and containing dissolved wax, comprising the steps of reducing the solubility for the wax so as to cause dissolved wax in the oil to form a dispersion of wax particles in the oil mixture and introducing free excess charge which is net unipolar into the oil mixture, whereby wax particle agglomeration and particle size growth occurs.

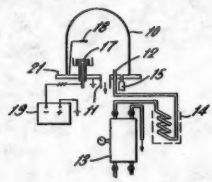
15. A method as claimed in claim 1, wherein a first oil solvent liquid is added to the waxy oil mixture to form an admixture, the admixture is cooled to the cloud point of the admixture in the absence of any introduced free excess charge, and then a second oil solvent liquid is added to said admixture, said second oil solvent liquid having a lower solubility for wax than for said admixture, so as to cause the wax to precipitate as wax particles, and the free excess charge is introduced into the admixture of waxy oil mixture and first and second oil solvents, to bring about agglomeration and growth of the precipitated wax particles.

4,627,902

METHOD OF PRODUCING A RESISTANCE ELEMENT FOR A RESISTANCE THERMOMETER

James S. Johnston, Bognor Regis; Leslie Holland, Crawley, and Christopher R. Wright, Bognor Regis, all of England, assignors to Rosemount Engineering Company Limited, England

Continuation-in-part of Ser. No. 359,872, Mar. 19, 1982, abandoned. This application Apr. 5, 1984, Ser. No. 597,164
Claims priority, application United Kingdom, Mar. 24, 1981, 8109239; Aug. 11, 1981, 8124559
Int. Cl.[4] C23C *14/38*
U.S. Cl. 204—192.21 18 Claims



1. A method of producing a thin film platinum resistance thermometer element having a TCR of about 3.85×10^{-3} ppm/°C. which comprises magnetron sputtering a platinum film onto an insulating substrate in a sputtering atmosphere consisting of at least about 20% by volume of oxygen, with the balance gas consisting primarily of nitrogen, and heat treating the film after sputtering to remove any entrapped oxygen from the film and reduce or dissociate platinum oxide in the film to platinum metal.

4,627,903

ELECTRODE FOR AN ELECTROSTATIC ATOMIZING DEVICE

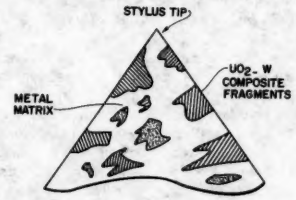
Alan T. Chapman, Atlanta, and David N. Hill, Chamblee, both of Ga., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Jul. 26, 1982, Ser. No. 401,833
Int. Cl.[4] B05B *5/00;* B22F *3/00*
U.S. Cl. 204—275 3 Claims

1. An improved electrode for an electrostatic atomizing device which comprises a cell having a chamber disposed therein, a discharge spray means in communication with the cell, at least two electrodes disposed in said chamber and being in liquid contact with a liquid in said chamber, and a third electrode disposed externally to said cell and said discharge means, wherein the improved electrode comprises a machined alloy of a blend mixture of a metal oxide-metal composite particle and a metal power, said alloy of said blend mixture formed under heat and pressure, wherein the volume fraction of said metal oxide-metal composite particle is 10 to 80 percent of said blend mixture, wherein said metal oxide-metal composite particles contain between 10^6 to 5×10^7 aligned, submicron diameter, metallic fibers per cm_2, wherein said composite particles are selected from the group consisting of UO_2—W, $Gd_2O_3(CeO_2)$—Mo, $ZrO_2(Y_2O_3)$—W and CeO_2—Mo, wherein said metal powder is selected from the group consisting of Cu, Co, Ni and Ni—Cu—CO and mixtures thereof.

2. A process for forming an electrode for an electrostatic atomizing device which comprises the steps of:

(a) blending a mixture of composite particles and metal powders, wherein the composite material is selected from the group consisting of UO_2—W, $Gd_2O_3(CeO_2)$—Mo, $ZrO_2(Y_2O_3)$—W and CeO_2—Mo, wherein said metal powders are selected from the group consisting of Cu, Ni, Co, and Ni—Cu—Co and mixtures thereof, and wherein



the volume fraction of said composite particles is 10 to 80 percent of said blend mixture;

(b) consolidating said mixture under sufficient heat and pressure;

(c) forming said mixture into a disc;

(d) cutting said disc into a square shaped bar; and

(e) machining said square shaped bar into a stylus shaped electrode.

4,627,904

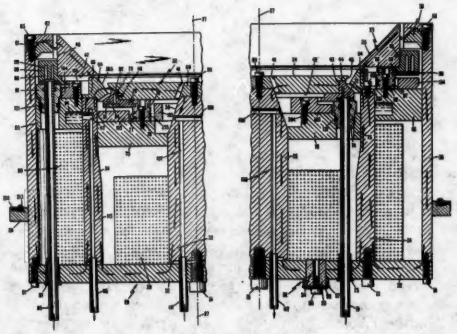
MAGNETRON SPUTTER DEVICE HAVING SEPARATE CONFINING MAGNETIC FIELDS TO SEPARATE TARGETS AND MAGNETICALLY ENHANCED R.F. BIAS

Donald M. Mintz, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 759,722, Jul. 29, 1985, which is a continuation-in-part of Ser. No. 611,435, May 17, 1984, Pat. No. 4,595,482. This application Dec. 19, 1985, Ser. No. 811,595

Int. Cl.[4] C23C *15/00*

U.S. Cl. 204—298 **15 Claims**



1. A vacuum sputtering device for causing material from a target means to be sputtered onto a workpiece, the target means including a first target having a planar material emitting surface with a circular outer perimeter and a second target having a sloped emitting surface relative to said planar emitting surface, said second target being a circular annulus having an axial thickness at an outer perimeter which is greater than an axial thickness at an inner perimeter, the device comprising means for supplying an ionizable gas to a space adapted to be evacuated, the space being between the target and workpiece, means for establishing an ionizing electric field for the gas in the space, means for establishing a confining magnetic field for the gas ionized by the electric field in the vicinity of the emitting surfaces of the first and second targets, means for mounting the targets so that emitted material is sputtered from the sloped emitting surface outside of the first target, magnetic mirror means located behind the workpiece for moving a plasma away from the workpiece, and means for connecting and R.F. bias power source to the workpiece.

4,627,905

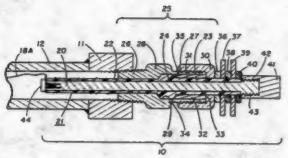
MONITOR ASSEMBLY FOR MONITORING ANODIC CORROSION PROTECTION OF CARBON STEEL VESSELS

Andrew Garner, and Douglas L. Singbeil, both of Pointe Claire, Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Canada

Continuation-in-part of Ser. No. 657,996, Oct. 5, 1984, abandoned. This application Jan. 28, 1986, Ser. No. 823,440

Int. Cl.[4] G01N *27/46;* **C23F** *13/00*

U.S. Cl. 204—404 **15 Claims**



1. A monitor assembly for monitoring the effectiveness of anodic protection of carbon steel vessels comprising:

(a) an electrically conductive mount rod adapted to be electrically connected through a voltmeter to said carbon steel vessel;

(b) an electrically non-conductive sleeve on said mount rod;

(c) an electrical sealing gland encasing said sleeve;

(d) a stainless steel apertured spacer disc mounted on said sleeve in electrical contact with said electrical sealing gland;

(e) a first carbon steel coupon mounted on said sleeve in electrical contact with said stainless steel disc;

(f) A first spacer element of electrically non-conductive material mounted on said sleeve adjacent to, in pressing contact with, said first carbon steel coupon;

(g) a second carbon steel coupon identical to said first carbon steel coupon mounted on said sleeve adjacent to, and in pressing contact with, said first spacer element;

(h) a second spacer element of electrically non-conductive material mounted on said sleeve adjacent to, and in pressing contact with, said second carbon steel coupon; and

(i) a reference electrode detachably but securely mounted in direct electrical contact with, and on said mount rod so that said reference electrode, but not said mount rod is wetted by the liquid contents of said carbon steel vessel;

said mount rod, and said electrical sealing gland being made of any metal with sufficient mechanical and chemical stability to withstand the corrosive environment within the carbon steel vessel and the mechanical stress; said electrically non-conductive sleeve and said electrically non-conductive spacer elements being formed of any electrically non-conductive material having sufficient mechanical and chemical stability to withstand the corrosive environment with the carbon steel vessel and the mechanical stress; and said reference electrode being formed from any metal which provides a stable potential when exposed to the liquid contents of said carbon steel vessel.

4,627,906

ELECTROCHEMICAL SENSOR HAVING IMPROVED STABILITY

David A. Gough, Cardiff By the Sea, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

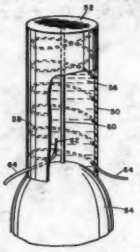
Continuation of Ser. No. 538,123, Oct. 3, 1983, abandoned. This application Aug. 22, 1985, Ser. No. 768,125

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—415 **9 Claims**

1. An electrochemical sensing device comprising an electrolyte container, an aqueous electrolyte in said container, a hol-

low cylindrical hydrophobic membrane forming a portion of said container and having a first outer surface accessible to a fluid to be monitored and a second inner surface accessible to said electrolyte, a cathode working electrode, a reference electrode and a counter electrode of cylindrical shape and open structure disposed adjacent the inner surface of said membrane and having its entire inner surface area exposed to and contacting said electrolyte in said container, said membrane being permeable to a component to be determined of said fluid, said counter electrode being coaxial with the interior of said membrane between said membrane and said working electrode and being constructed to allow free diffusion



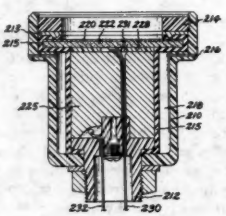
through it radially into said electrolyte and to said working electrode of said component to be determined, said working electrode being a rod extending along the axis of said cylindrical hydrophobic membrane and counter electrode along the entire length of said counter electrode and having all portions of it's surface in contact with said electrolyte and at a constant spacing from said counter electrode along the length of said cylindrical hydrophobic membrane to provide a substantially uniform current flux through the electrolyte between all points of said working electrode and opposed points of said counter electrode.

4,627,907

LONG LIFE PORTABLE OXYGEN SENSOR WITH HIGH STABILITY

Leonard W. Niedrach, Schenectady, and Fritz G. Will, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 2, 1984, Ser. No. 667,934
Int. Cl.[4] G01N *27/52*
U.S. Cl. 204—415 **8 Claims**



1. An oxygen sensor of improved stable sensitivity which comprises

a sensor electrode adapted to reduce oxygen which permeates thereto through a diffusion barrier,

a counter electrode of porous cadmium metal formed on a support structure of nickel foam metal

a set of conductors and a thermistor/resistor network providing a series electric connection between said electrodes and a voltmeter in parallel with said network and providing indication of oxygen level by calibrated readings of said voltmeter, and

an aqueous alkaline solution providing an electrolytic path between said electrodes.

4,627,908

PROCESS FOR STABILIZING LUBE BASE STOCKS DERIVED FROM BRIGHT STOCK

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 24, 1985, Ser. No. 790,704
Int. Cl.[4] C10G *65/08, 65/12*
U.S. Cl. 208—58 **14 Claims**

1. An improved process for stabilizing a nitro-aromatic-containing lubricating oil base stock derived from a hydrocracked bright stock, comprising:

(a) contacting said hydrocracked bright stock with hydrogen in the presence of a catalyst having hydrodenitrification activity under conditions effective to reduce the nitrogen content of said stock and to minimize cracking to produce a substantially nitrogen-free product; and

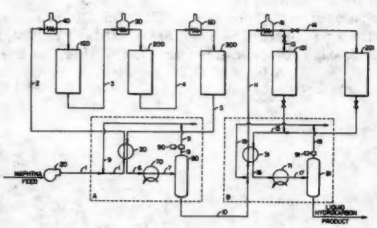
(b) contacting said substantially nitrogen-free product with hydrogen in the presence of a catalyst having hydrogenation activity under mild conditions to produce a stabilized lubricating oil base stock having improved oxidation stability as shown by oxidator BN.

4,627,909

DUAL RECYCLE PRESSURE-STEP REFORMER WITH CYCLIC REGENERATION

Richard C. Robinson, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 2, 1985, Ser. No. 730,698
Int. Cl.[4] C10G *35/06*
U.S. Cl. 208—65 **3 Claims**



1. A process for reforming a hydrocarbon feedstock which comprises the steps of:

A. contacting said feedstock and a first hydrogen-containing gas with a reforming catalyst, wherein said catalyst is bifunctional and comprises one or more platinum group metals supported on a porous alumina carrier, under reforming conditions including a first reforming pressure of about 200 psig in a first reforming zone said reforming zone comprises at least two reactors in series such that the effluent from the outlet of preceding reactor is fed directly to the inlet of a succeeding reactor;

B. separating a first hydrogen-containing gas phase and a first liquid hydrocarbon product phase from the effluent from said first reforming zone;

C. recycling at least a portion of said first gas phase to provide said first hydrogen-containing gas passed into said first reforming zone;

D. contacting said first product phase in the presence of hydrogen with a desulfurization catalyst to produce a desulfurized product phase;

E. contacting said desulfurized first product phase and a second hydrogen-containing gas with a reforming catalyst, wherein said catalyst is monofunctional and comprises a platinum group metal supported on a large pore zeolite, under reforming conditions including a second

reforming pressure ranging from about 75 psig to about 125 psig said reforming zone comprises at least two reactors in parallel such that a given reactor can be isolated for regeneration while the other reactor remains in service;

F. separating a second hydrogen-containing gas phase and a second liquid hydrocarbon product phase from the effluent of said second reforming zone;

G. recycling at least a portion of said second gas phase to provide said second hydrogen-containing gas passed into said second reforming zone; and

H. recovering said second liquid product phase.

4,627,910

HYDROCARBON CONVERSION PROCESS

William S. Millman, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 491,882, May 5, 1983, Pat. No. 4,425,221, which is a division of Ser. No. 287,022, Jul. 27, 1981, Pat. No. 4,392,985. This application Oct. 19, 1983, Ser. No. 543,245

The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.

Int. Cl.[4] C10G *11/04, 45/08, 49/04*

U.S. Cl. 208—112 **37 Claims**

9. A process for the removal of nitrogen from a hydrocarbon feedstock, boiling primarily above 100° F., which comprises contacting said feedstock with hydrogen under denitrogenation conditions including a superatmospheric pressure and a hydrogen flow rate in the range from about 25 SCF/bbl to about 20,000 SCF/bbl in the presence of a catalytic composition which is prepared by the method comprising the steps of (1) impregnating support particles with an aqueous solution comprising dissolved cobalt, phosphorus, at least 17 weight percent of Group VIB metal components, calculated as the trioxides, and ammonium ions with a molar concentration greater than 1.5, said solution having a pH less than 1.0 and wherein said dissolved phosphorus, calculated as P, is in a weight ratio to the Group VIB metal trioxide of about 0.01 to 0.5, and (2) activating the impregnated support particles.

22. A process for removing metals from a hydrocarbon feedstock boiling primarily above 100° F. by contacting said feedstock with hydrogen under demetallizing conditions including a superatmospheric pressure and a hydrogen flow rate in the range from about 25 scf/bbl to about 20,000 scf/bbl in the presence of a catalytic composition which is prepared by the method comprising the steps of (1) impregnating support particles with an aqueous solution comprising dissolved cobalt, phosphorus, at least 17 weight percent of Group VIB metal components, calculated as the trioxides, and ammonium ions with a molar concentration greater than 1.5, said solution having a pH less than 1.0 and wherein said dissolved phosphorus, calculated as P, is in a weight ratio to the Group VIB metal trioxide of about 0.01 to 0.5, and (2) activating the impregnated support particles.

33. A hydrocarbon cracking process comprising contacting hydrocarbons boiling primarily above 100° F. under cracking conditions comprising a superatmospheric pressure and a temperature of at least 400° F. with a catalytic composition prepared by the method comprising the steps of (1) impregnating support particles with an aqueus impregnating solution comprising dissolved cobalt, phosphorus, and at least 17 weight percent of Group VIB metal components, calculated as the trioxides, and wherein said dissolved phosphorus, calculated as P, is in a weight ratio to the Group VIB metal trioxide of about 0.05 to about 0.5, said solution having a pH less than 1.0 and is characterized by a maximum extinction coefficient in the ultraviolet spectrum of about 0.7×10^4 to about 1.8×10^4 liters/cm.moles of Group VIB metal, and (2) activating the impregnated support particles.

4,627,911

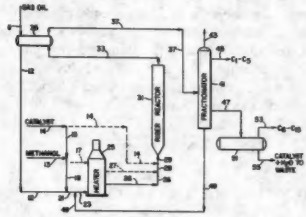
DISPERSED CATALYST CRACKING WITH METHANOL AS A COREACTANT

Nai Y. Chen, Titusville, N.J., and Thomas F. Degnan, Jr., Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 767,666, Aug. 21, 1985, abandoned, which is a continuation of Ser. No. 622,818, Jun. 21, 1984, abandoned. This application Dec. 30, 1985, Ser. No. 815,660

Int. Cl.[4] C10G *11/05, 47/16;* C07C *1/24*

U.S. Cl. 208—120 **12 Claims**



1. A process for thermally sustaining an endothermal catalytic hydrocarbon cracking reaction without catalyst regeneration, said process comprising:

A. admixing a hydrocarbon, a carbon oxygenate, and a finely divided and highly active zeolite catalyst capable of cracking said hydrocarbon and exothermically converting said carbon oxygenate to a hydrocarbon of increased carbon content to form a feed mixture, within which said zeolite catalyst is dispersed, and feeding said mixture to a reaction zone; said zeolite catalyst provided in amounts of up to 5.0 wt. % of said hydrocarbon and having an α activity of at least 1600

B. heating said feed mixture to a reaction temperature at which said feed mixture is volatilized;

C. reacting said feed mixture within said reaction zone without substantial use of surface heat exchanging whereby said endothermic catalytic hydrocarbon cracking reaction is sustained substantially entirely by said exothermic catalytic carbon oxygenate conversion reaction; and

D. withdrawing said catalyst and the combined reaction products of said cracking and conversion reactions from said reaction zone.

4,627,912

REFORMING PROCESS HAVING A HIGH SELECTIVITY AND ACTIVITY FOR DEHYDROCYCLIZATION, ISOMERIZATION, AND DEHYDROISOMERIZATION

Leslie A. Field, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 509,277, Jun. 30, 1983, abandoned. This application Nov. 14, 1983, Ser. No. 550,841

Int. Cl.[4] C10G *35/08*

U.S. Cl. 708—139 **9 Claims**

1. A hydrocarbon conversion process comprising contacting a hydrocarbon feed with a reforming catalyst in the presence of a halogen at conditions which favor dehydrocyclization, isomerization, and dehydroisomerization of the hydrocarbon feed; wherein said reforming catalyst comprises a type L zeolite containing at least one Group VIII metal and an alkaline earth metal selected from the group consisting of barium, strontium and calcium.

4,627,913
CATALYTIC COAL LIQUEFACTION WITH TREATED SOLVENT AND SRC RECYCLE

Diwakar Garg, Macungie; Edwin N. Givens, Bethlehem, and Frank K. Schweighardt, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

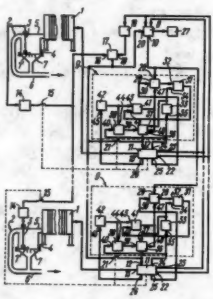
Filed Jan. 9, 1985, Ser. No. 690,009
Int. Cl.[4] C10G *1/06*
U.S. Cl. 208—415 **8 Claims**

1. A process for the catalytic solvent refining of coal comprising contacting coal at elevated temperature and pressure in a hydrogen atmosphere and using a hydrocarbon solvent boiling in the range of 350° to 950° F. in which a predominant amount of the phenolic and nitrogenous base constituents from the solvents are removed when the solvent is recycled and the solvent refining is performed in the presence of an added catalyst to produce liquid hydrocarbons and normally solid, solvent-refined coal wherein at least a portion of the pyridine-soluble, pentane-insoluble solvent-refined coal is recycled to the process.

4,627,914
DEVICE FOR AUTOMATIC CONTROL OF PRESSURE FILTERS

Viktor I. Antonenko, Narimanova, 6, kv. 140, Kharkov, ploschad, U.S.S.R.

PCT No. PCT/SU85/00050, § 371 Date Feb. 7, 1986, § 102(e) Date Feb. 7, 1986, PCT Pub. No. WO86/00240, PCT Pub. Date Jan. 16, 1986
PCT Filed Jun. 21, 1985, Ser. No. 830,526
Claims priority, application U.S.S.R., Jun. 21, 1984, 3759875
Int. Cl.[4] B01D *25/12*
U.S. Cl. 210—96.1 **2 Claims**

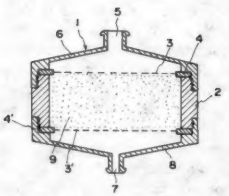


1. A device for automatic control of pressure filters used to dewater suspensions, comprising a control assembly connected to at least one pressure filter (1) and intended for determination of the duration of the suspension dewatering process and provided with a sensor (3) which determines, in the course of dewatering, the moment the solid phase of the suspension reaches assigned parameters, a unit (8) for timing the process of suspension dewatering, which is electrically connected to the sensor (3), control consoles (11) whose number is equal to that of the pressure filters (1), an input (12) of each control console (11) being electrically connected to an output of the timer unit (8), while an output (13) of each control console (11) is connected to an actuating device of each respective pressure filter (1), characterized in that it also comprises a frequency generator (19) whose control input and a first control input of the timer unit (8) are joined together and connected to outputs (22) of the control consoles (11), a second control input of the timer unit (8) is connected to outputs (23) of the control consoles (11), control units (9) whose number is equal to that of the pressure filters (1), a first input of each control unit (9) is connected to the output of the timer unit (8), an output of each control unit (9) is connected to the input (12) of the respective control console (11), the control assembly being connected to at least one pressure filter (1) by means of a filtrate pipe (2), the control assembly being essentially a vertically arranged pipe (4) whose cross-section is equal to or larger than that of the filtrate pipe (2) and which is communicated by the upper end thereof with an initial portion (5) of the filtrate pipe (2), while the lower end thereof is limited by a baffle (7) having a calibrated opening (7') through which the pipe (4) communicates with a final portion (6) of the filtrate pipe (2), the sensor (3) is a capacitance-type element arranged inside the pipe (4) throughout its length so that the axis of the capacitance-type element is displaced in relation to the axis of the calibrated opening (7'), the electrical connection of the sensor (3) with the timer unit (8) is effected via a series-connected elements, namely a capacitance-to-frequency converter (14), a switch (15) for sensor engagement and a frequency coincidence unit (17) connected to an output of the frequency generator (19) and via suspension dewatering termination switches (21) whose number is equal to that of the pressure filters (1) and which are connected to the input (12) of each control console (11), which is joined with an input (20) of the unit (8), outputs (24, 25, 26) of each control console (11) being connected respectively to a second, third and fourth inputs of respective control console (11), the sensor switch (15) and the suspension dewatering termination switch (21) of a respective pressure filter (1) being joined with the switch of the control console (11) of the same pressure filter (1).

4,627,915
ABSORBENT OF AUTOANTIBODY AND IMMUNE COMPLEXES, ADSORBING DEVICE AND BLOOD PURIFYING APPARATUS COMPRISING THE SAME

Toru Kuroda, and Naokuni Yamawaki, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 23, 1984, Ser. No. 592,631
Claims priority, application Japan, Apr. 6, 1983, 58-59197; Apr. 6, 1983, 58-59199
Int. Cl.[4] B01D *15/00*
U.S. Cl. 210—195.2 **16 Claims**



16. A blood purifying apparatus for adsorbing and removing an autoantibody and/or immune complexes from blood plasma, which comprises a blood introduction means, a purified blood discharge means, a blood circulation passage provided with a plasma separating means and a blood-plasma mixing means, and a plasma recycle passage having both ends connected respectively to intermediate portions of said blood circulation passage to introduce plasma, which is separated by the plasma separating means, into said mixing means, through a plasma purifying means, said blood circulation passage running between said blood introduction means and said purified blood discharge means, and wherein said plasma purifying means comprises a vessel having a fluid inlet and a fluid outlet and, contained in the vessel, an adsorbent comprising a surface and, linked with the surface, at least one hydrophobic member having 6 to 700 carbon atoms and further, linked with the surface or with the hydrophobic member or with the both, at least one negative charge-producing member having no carbon atom or having 1 to 5 carbon atoms, said negative charge-pro-

ducing member being adapted to produce such an effective number of negative charges in a body fluid that the ratio of:

$$\frac{\text{Effective number of negative charges}}{\text{Number of said hydrophobic members}}$$

is greater than 1.

4,627,916

DIRT FILTER FOR SEMIFLUID THERMOPLASTIC MEDIA

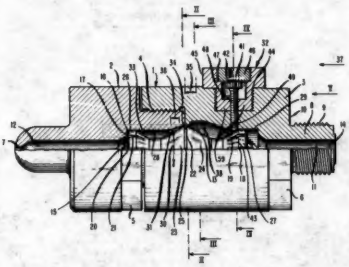
Karl-Heinz Dörsam, Buchen-Bödigheim, Fed. Rep. of Germany, assignor to Odenwälder Kunststoffwerke GmbH, Buchen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 656,903, Oct. 2, 1984, abandoned. This application Oct. 1, 1985, Ser. No. 733,237

Claims priority, application European Pat. Off., Jan. 28, 1984, 84100896.4; Aug. 22, 1984, 84109965.8; Fed. Rep. of Germany, Jul. 19, 1985, 8520879

Int. Cl.⁴ B29C *47/68, 45/17*

U.S. Cl. 210—488 **21 Claims**



1. A dirt filter for semifluid thermoplastic media comprising:

a housing for a filter chamber hollowed out from said housing;

means for opening the housing;

a flow axis;

a barrier member disposed in the filter chamber, which barrier member is adjustable in its position by sliding along the flow axis from a filtering position to a cleaning position and vice versa;

a feed line inlet hollowed out from the housing, which issues into the filter chamber;

a discharge line hollowed out from the housing, which is led out of the housing on a side which is opposite to

a side of the barrier member, having the feed line inlet;

an annular slot disposed between a surrounding area of the barrier member disposed coaxially to the flow axis and to an oppositely disposed inner wall of the filter chamber, the annular slot being part of the flow connection between feed line inlet and discharge line; in the filtering position of the barrier member the annular slot is a blocking slot, which is narrower than the diameter of the dirt particles to be retained so such particles cannot pass through;

when the barrier member is in the cleaning position clearance between the barrier member and chamber wall is greater than the diameter of the dirt particles retained by the blocking slot so the particles can pass through; an adjustment member accessible from the outside for adjusting the position of the blocking member from its filtering position into the cleaning position and vice versa;

a guide body adjoining the end of the blocking body on the side disposed toward the feed line inlet; a bead provided at the guide body and protruding outwardly in a radial direction relative to the flow axis and matching a guide recess of the housing when the barrier member is displaced in the direction of the flow axis and where the adjustment member is coupled in a force transmitting way at the circumference of the bead; channels distributed along the circumference of the bead of the guide body for flow through of semifluid thermoplastic media, where the passage width of the channels is larger than the passage width of the blocking slot.

4,627,917

PROCESS FOR THE ANAEROBIC DECOMPOSITION OF ORGANIC SUBSTRATE

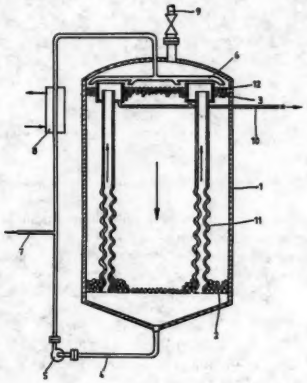
Manfred Morper, Gauting, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 19, 1985, Ser. No. 725,279

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414999

Int. Cl.⁴ C02F *3/28*

U.S. Cl. 210—617 **8 Claims**



1. In a process for the anaerobic decomposition of organic substrate in which organic substrate to be treated is conducted through a submerged filter bed arranged in a treatment zone or reactor, said filter bed being a carrier for settling biodegrading microorganisms therein or thereon, and substrate treated in the filter bed is partially recycled thereto, the improvment comprising conducting the organic substrate being treated in a downflow mode through said submerged filter bed to thereby treat said organic substrate, said recycling being conducted by separating a partial stream of substrate treated at the bottom of the treatment zone and passing it to the top, and conducting another partial stream of treated substrate in an upflow mode in contact with nicroorganisms fixed within conduit means through which said stream is passed and discharging treated effluent directly from said another partial stream from a region in the vicinity of the top of the treatment zone.

4,627,918

CHROMATOGRAPHY COLUMN USING HORIZONTAL FLOW

Vinit Saxena, Pinole, Calif., assignor to Sepragen Corporation, Pinole, Calif.

Filed Nov. 4, 1985, Ser. No. 794,727

Int. Cl.⁴ B01D *15/08*

U.S. Cl. 210—656 **32 Claims**

1. A chromatography column utilizing horizontal flow of sample material passing therethrough comprising:

a housing defining a chamber therein and including at least one removable end section,

a pair of longitudinally extending porous frits positioned in spaced relation within said chamber of said housing,

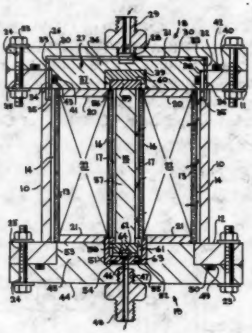
a bed of chromatographic separation material positioned in

said chamber of said housing and intermediate said porous frits,

one of said porous frits being spaced from said housing to define an inlet channel therebetween,

another of said porous frits being positioned to define an outlet channel,

distribution means operatively connected to said inlet channel,



collector means operatively connected to said outlet channel,

said distribution means and said inlet channel being constructed to direct associated material to be separated in said bed evenly across a longitudinal length of said bed in a substantially horizontal direction.

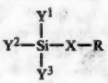
4,627,919

RESOLVING AGENT

Yoichi Yuki, Himeji, Japan, assignor to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 21, 1986, Ser. No. 821,084
Int. Cl.[4] B01B *15/08*
U.S. Cl. 210—656 **6 Claims**

1. A method for the optical resolution of a racemic mixture with a compound having the formula:



(I)

wherein at least one group selected from among Y^1, Y^2 and Y^3 represents silica gel and/or a siloxane bond moiety therewith while others represent each a hydrogen atom, an alkyl group having one to 20 carbon atoms, an aryl group having six to 20 carbon atoms, an arylalkyl group having seven to 20 carbon atoms, a halogen atom, a hydroxyl group, an alkoxy group having one to 20 carbon atoms or a combination thereof; X represents a spacer having one to 30 carbon atoms; and R is a metal salt of optically active t-leucine or tryptophane.

4,627,920

PROCESS FOR THE RETENTION OF A SUBSTANCE DISSOLVED IN A SOLUTION

Roger Chatelin, Lozanne; Jean-Francois Combes, Servian, and Daniel Wattiez, Lozanne, all of France, assignors to Institut Textile de France, Boulogne Billancourt, France

Filed Jul. 17, 1984, Ser. No. 631,680
Claims priority, application France, Jul. 22, 1983, 83 12187
Int. Cl.[4] B01D *15/04*
U.S. Cl. 210—668 **18 Claims**

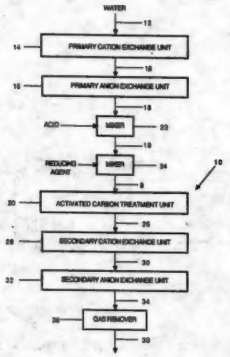
1. A process for the retention of at least one substance dissolved in a solution, wherein, in a first step, an excess of a soluble organic polyelectrolyte capable of forming an ionic association with the said substance is added to the solution to form a soluble entity wherein said polyelectrolyte contains electrolyte groups ionically associated with said substance and other electrolyte groups not ionically associated with said substance and in a second step, the solution thus obtained is brought into contact with a material possessing ionic groups which retain the polyelectrolyte by virtue of said electrolyte groups not ionically associated with the said substance.

4,627,921

TREATMENT OF WATER TO LOWER THE OXYGEN AND THE TOTAL ORGANIC CARBON WITHIN THE SAME

Peter S. Meyers, West Covina, and Gerald Alexander, La Canada, both of Calif., assignors to L A Water Treatment Corporation, City of Industry, Calif.

Filed Apr. 29, 1985, Ser. No. 728,289
Int. Cl.[4] C02F *9/00*
U.S. Cl. 210—668 **3 Claims**



1. A process of treating water to lower the total organic carbon and oxygen content of the water which comprises the steps of:

adjusting the acidity of the water being treated to a pH of from about 4 to about 6.9 by the addition of a mineral acid to said water;

adding a reducing agent selected from the group consisting of hydrazine, morpholine, sodium sulfite and sodium acid sulfite capable of reacting with the total organic carbon and oxygen in said water so as to reduce the levels of both of them in excess of an amount necessary to react with all of the oxygen and total organic carbon in said water and allowing contact between the water and the reducing agent for a time period and at a temperture in order to achieve such reduction; and

passing water mixed with the reducing agent through an absorbent, adsorbent bed within a housing while maintaining the interior of said housing anaerobic.

4,627,922

METHOD OF REMOVING DISSOLVED OIL FROM PRODUCED WATER

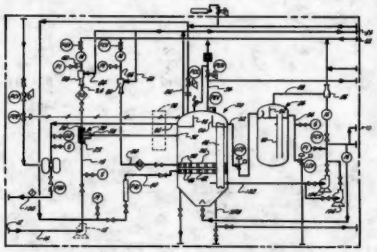
Carrol L. Viator; Glenn E. Gilley, both of Lafayette; Paul C. Broussard, Sr., Maurice; Curtis Broussard, and Dennis Gracy, both of Lafayette, all of La., assignors to Gilley and Associates, Lafayette, La.

Filed Oct. 29, 1984, Ser. No. 665,741
Int. Cl.[4] C02F *1/24*
U.S. Cl. 210—704 **29 Claims**

1. A method of removing dissolved oil from water, the

dissolved oil being comprised of hydrocarbon additives solvated by water molecules, the hydrocarbon additives having a hydrocarbon structure with an attached group for providing extra electrons for attaching the hydrocarbon additive to metal, the method comprising the steps of:

turbulently contacting a first gas comprising dichlorodifluo-



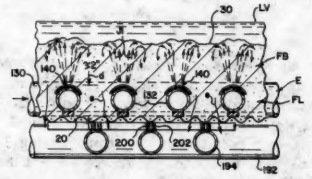
romethane with the water to create bubbles that move dissolved oil particles to a surface of the water, the first gas comprising an effective amount of dichlorodifluoromethane to molecularly attract the dissolved oil particles through hydrogen bonding, and preferentially displace solvating water molecules, and removing the dissolved oil from the surface.

4,627,923

APPARATUS AND METHOD OF FILTERING SOLIDS FROM A LIQUID EFFLUENT

David S. Ross, Lorain, Ohio, assignor to International Tectonics Incorporated, Avon Lake, Ohio

Filed Sep. 20, 1984, Ser. No. 652,873
Int. Cl.[4] B01D *23/24*
U.S. Cl. 210—744 **45 Claims**



1. Method of operating a waste effluent filter including a tank having a lower portion; a generally flat fine mesh element supported adjacent said lower portion and having a multitude of apertures; an underdrain cavity adjacent said lower portion and under said fine mesh element and generally coextensive with said fine mesh element; a filter bed of particulate material having an upper surface; a parallel lower surface on said generally flat fine mesh element, a generally uniform depth between said fine mesh element and said upper surface and an effective particle size at least greater than the size of said apertures of said fine mesh elements; means for directing effluent into said filter above said upper surface; and, means for directing filtered effluent from said underdrain cavity, said method comprising the steps of:

(a) allowing liquid in said tank to increase to a level substantially above said upper surface during filtering; and,

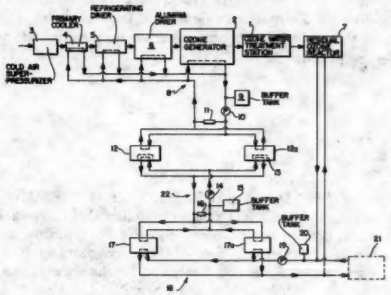
(b) during such filtering, periodically regenerating said upper surface by folding filtered material at said upper surface into said filter bed by directing a plurality of evenly distributed hydraulic jets upwardly through said filter bed from a position in said bed and above said flat fine mesh element a given distance whereby a lower filtering layer of said bed remains undisturbed between said jets and said fine mesh element while said upper surface is regenerated.

4,627,924

PROCESS AND APPARATUS FOR THE RECOVERY OF ENERGY FROM AN OZONE PRODUCTION UNIT

Christian Coste, Versailles, France, assignor to Degremont, Rueil-Malmaison, France

Continuation of Ser. No. 490,412, May 2, 1983, abandoned. This application Feb. 13, 1985, Ser. No. 700,342
Claims priority, application France, Mar. 29, 1983, 83 05117
Int. Cl.[4] C02F *1/78*
U.S. Cl. 210—760 **10 Claims**



1. A process for the recovery of energy from an ozone production unit including an ozone generator supplied with gas from pretreatment units, and using ozone produced thereby to treat water said process comprising:

providing a first closed fluid circuit having therein a first fluid;

circulating said first fluid through said first closed fluid circuit and in heat exchange relationship with gas in said pretreatment units and said ozone generator, thereby transferring heat from said gas to said first fluid;

providing said first closed fluid circuit with at least one refrigerating unit having a condenser, and by said at least one refrigerating unit cooling the thus heated said first fluid and maintaining constant the temperatures in said pretreatment units and said ozone generator;

providing a second closed fluid circuit having therein a second fluid and including said condenser and at least one heat pump;

circulating said second fluid through said condenser in said second closed fluid circuit in heat exchange relationship with said heat first fluid and thereby transferring said heat to said second fluid;

providing a third closed fluid circuit having therein a third fluid;

circulating said third fluid through said third closed fluid circuit in heat exchange relationship with the thus heated said second fluid in said at least one heat pump and thereby transferring heat to said third fluid;

providing an ozone water treatment facility and treating water therein by means of ozone produced by said ozone generator;

providing a residual ozone reactor and transferring thereto residual ozone remaining after treatment thereby at said facility; and

passing said heated third fluid to said residual ozone reactor and utilizing the heat from said third fluid for destroying said residual ozone in said reactor.

4,627,925

AQUEOUS CONCENTRATED FABRIC SOFTENING COMPOSITION

Robert M. Butterworth; John R. Martin, and Edwin Willis, all of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 4, 1985, Ser. No. 719,676

Claims priority, application United Kingdom, Apr. 19, 1984, 8410321

Int. Cl.[4] D06M *11/00*

U.S. Cl. 252—8.8 **6 Claims**

1. An aqueous concentrated fabric softening composition comprising:

(i) an aqueous base;

(ii) more than 10% by weight of a water-insoluble cationic fabric softener; and

(iii) about 3.5% by weight of a nonionic material which is a fatty coco amine ethoxylated with an average of approximately 5 ethylene oxide groups per molecule,

the total level of the cationic softener and the nonionic material being not more than 36% by weight.

4,627,926

THERMALLY STABLE BOREHOLE FLUIDS

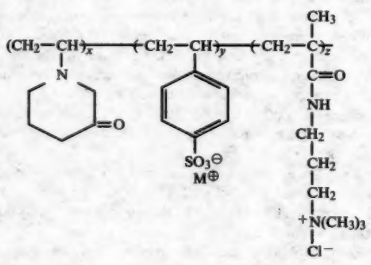
Dennis G. Peiffer, East Brunswick; Robert D. Lundberg, Bridgewater, both of N.J.; Lawrence P. Sedillo, Houston, and John Newlove, Kingwood, both of Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 19, 1984, Ser. No. 651,900

Int. Cl.[4] E21B *43/00, 43/26*

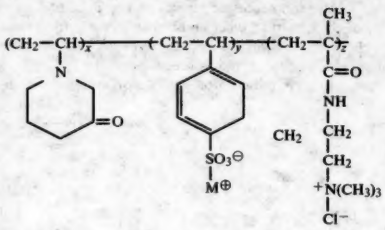
U.S. Cl. 252—8.55 R **8 Claims**

1. A method of completing a subterranean formation of an oil or gas well to increase the recovery of hydrocarbons from the producing reservoir which comprises dissolving about 0.25 to about 20 lb/bbl of a water soluble terpolymer in an aqueous salt solution to viscosify said aqueous salt solution and pumping said aqueous salt solution with said water base terpolymer dissolved therein into said well to control the subsurface pressures of said well, wherein said terpolymer has the formula:



wherein x is about 70 to about 98 mole %, y is about 1 to about 15 mole %, z is about 1 to about 15 mole %, wherein y and z are less than 60 mole %, and M is selected from the group consisting of amines and a metallic cation being selected from the group consisting of lead, iron, aluminum, Groups IA, IIA, IB and II of the Periodic Table of Elements.

5. A method of fracturing a subterranean formation of a gas or oil well which comprises dissolving about 0.25 to about 20 lb/bbl of a water soluble terpolymer into an aqueous salt solution to viscosify said aqueous salt solution and pumping said aqueous salt solution with terpolymer dissolved therein into said well to apply hydraulic pressure to such formation wherein said terpolymer has the formula:



4,627,927

ADDITIVE COMPOSITION FOR GRANULAR DETERGENT

Takenobu Sakatani, Chiba, and Shigeru Suzuki, Ichikawa, both of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation of Ser. No. 509,728, Jun. 30, 1983, abandoned. This application May 28, 1985, Ser. No. 738,514

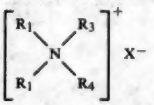
Claims priority, application Japan, Jul. 5, 1982, 57-116589

Int. Cl.[4] D06M *13/46;* C11D *7/32*

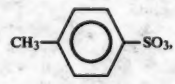
U.S. Cl. 252—8.75 **4 Claims**

1. An additive composition for a granular detergent comprising:

(a) a quaternary ammonium salt having the general formula (I):



wherein R_1 and R_2 independently represent an alkyl group having 12 to 26 carbon atoms, R_3 and R_4 independently represent an alkyl group having 1 to 4 carbon atoms, a benzyl group, a hydroxyalkyl group having 2 to 4 carbon atoms, or a polyoxyalkylene group having 1 to 5 mole oxyalkylene units, and X represents a halogen atom, CH_3SO_4, $C_2H_5SO_4$, or



and

(b) at least one nonionic surfactant selected from the group consisting of alkyl- or alkenyl-ethoxylates having an alkyl or alkenyl with 9 to 11 carbon atoms and having an average ethylene oxide addition mole number of 5 to 12, alkyl- or alkenyl-phenylethoxylates having an alkyl or alkenyl with 6 to 13 carbon atoms and having an average ethylene oxide addition mole number of 3 to 8, sucrose mono- or di-fatty acid esters, and sorbitan mono- or di-fatty acid esters, the ratio of component (a)/component (b) in a weight basis of 99.5/0.5 to 50/50, and

said additive composition being granulated from a mixture of the molten quaternary ammonium salt having the general formula (I) and the nonionic surfactant by (i) spraying the mixture, followed by cooling or (ii) solidifying the mixture upon cooling, followed by crushing.

4,627,928

BASIC NON-CARBONATED MAGNESIUM COMPOSITIONS AND FUEL, LUBRICANT AND ADDITIVE CONCENTRATE COMPOSITIONS CONTAINING SAME

Jack L. Karn, Richmond Hgts., Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 267,441, May 27, 1981, abandoned, which is a continuation of Ser. No. 718,448, Aug. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 322,246, Jan. 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 201,154, Nov. 22, 1971, abandoned. This application Jul. 29, 1985, Ser. No. 761,296

Int. Cl.[4] C10M *179/26*; C10L *1/32*

U.S. Cl. 252—33 **44 Claims**

1. A process for preparing a noncarbonated, basic magnesium salt of a substituted hydroxy-containing aromatic carboxylic acid having a magnesium content of at least 150% and up to about 250% of the stoichiometrically equivalent amount, based on the total amount of acid present, which consists essentially of reacting at a temperature of about 25° C. up to the decomposition temperature of a reactant, in the absence of any inorganic acid material

(A) at least one hydrocarbyl-substituted or substantially hydrocarbyl-substituted aromatic hydroxy carboxylic acid, salt or saponifiable derivative thereof, wherein the substantially hydrocarbon substituent contains up to about 10 weight percent of polar groups selected from the group consisting of mercapto, halogen, nitro, amino, nitroso, sulfo, keto, oxo groups and various combinations thereof, and;

(B) a stoichiometric excess of at least one basically reactive magnesium compound selected from the group consisting of magnesium oxides, hydroxides and alkoxides for each equivalent of said acid salt or derivative thereof, in the presence of

(C) at least about 0.1 mole of water for each equivalent of magnesium compound, and then refluxing the resulting mixture for a least about 0.5 hour with the proviso that the reaction is carried out in the absence of any carboxylic acid other than (A).

4,627,929

STABILIZED LUBRICANTS BASED ON POLYETHERS

Hans-Josef Buysch, Krefeld; Siegfried Kussi, and Günther Boehmke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

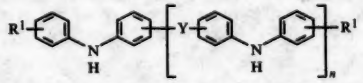
Filed Dec. 2, 1985, Ser. No. 803,458

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444884

Int. Cl.[4] C10M *165/18, 119/24*

U.S. Cl. 252—47 **10 Claims**

1. A stabilized lubricant composition comprising a polyether lubricant, and an effective stabilizing amount of a diphenylamine derivative of the formula



in which R^1 denotes hydrogen, a straight-chain or branched C_4 to C_{12}-alkyl group, a straight-chain or branched C_4 to C_{12}-alkylene group, a C_7 to C_{12}-aralkyl group, a C_7 to C_{12}-aralkylene group, a C_5 to C_{12}-cycloalkyl group which is optionally substituted by C_1 to C_6-alkyl, -alkenyl, -cycloalkyl or -cycloalkenyl, or a C_5 to C_{12}-cycloalkenyl group which is optionally substituted by C_1 to C_6-alkyl, -alkenyl or -cycloalkenyl, but does not denote a hydrocarbon group derived from a terpene, in the ortho- or para-position relative to the particular N atom, n represents an integer from 1 to 29 and Y represents a bifunctional radical —A— and optionally additionally a bifunctional radical —B—, in each case in the ortho- or para-position relative to the N atoms, wherein —A— denotes a straight-chain or branched C_4 to C_{12}-alkylene radical, a C_7 to C_{12}-aralkylene radical, or a C_5 to C_{12}-cycloalkylene radical which is optionally substituted by C_1 to C_6-alkyl or -cycloalkyl, but does not denote a hydrocarbon radical derived from a terpene, and —B— denotes —S— or

wherein R^2 represents hydrogen, C_1 to C_6-alkyl or C_5 to C_6-cycloalkyl and wherein —B— makes up an amount of 0 to 50 mol% of Y.

4,627,930

BORON-CONTAINING HETEROCYCLIC COMPOUNDS AND LUBRICATING OIL CONTAINING SAME

Richard A. Holstedt, Whittier; Kenneth Baron, Diamond Bar, and Peter J. Jessup, Santa Ana, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

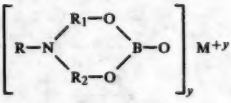
Continuation-in-part of Ser. No. 679,286, Dec. 7, 1984, Ser. No. 525,691, Aug. 23, 1983, abandoned, Ser. No. 525,718, Aug. 23, 1983, abandoned, Ser. No. 525,719, Aug. 23, 1983, abandoned, Ser. No. 525,720, Aug. 23, 1983, abandoned, Ser. No. 482,941, Apr. 7, 1983, Ser. No. 476,513, Mar. 1, 1983, Pat. No. 4,533,480, Ser. No. 418,196, Sep. 15, 1982, Pat. No. 4,511,516, and Ser. No. 329,385, Dec. 10, 1981, said Ser. No. 679,286, is a continuation-in-part of Ser. No. 158,981, Jun. 12, 1980, abandoned, said Ser. No. 525,718, is a continuation-in-part of Ser. No. 158,828, Jun. 12, 1980, Pat. No. 4,400,284, Ser. No. 158,981, and Ser. No. 418,196, which is a continuation-in-part of Ser. No. 158,828, and Ser. No. 158,981, said Ser. No. 525,720, is a continuation-in-part of Ser. No. 476,513, Ser. No. 434,602, Oct. 15, 1982, Pat. No. 4,490,265, Ser. No. 333,998, Dec. 23, 1981, Pat. No. 4,412,928, Ser. No. 329,384, Dec. 10, 1981, Pat. No. 4,427,560, Ser. No. 329,385, and Ser. No. 319,073, Nov. 9, 1981, Pat. No. 4,410,436, said Ser. No. 482,941, is a division of said Ser. No. 158,828. This application Jan. 29, 1985, Ser. No. 695,959

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.[4] C10M *1/20, 1/32, 1/54*

U.S. Cl. 252—49.6 **59 Claims**

1. A boron-containing heterocyclic compound of the formula:



wherein:

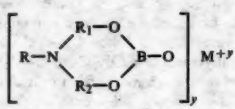
y is an integer;

M is a metal, semimetal or metalloid selected from the periodic groups IB, IIB, IIIB, IVB, VB, VIB, VIIB, VIII, IIIA, IVA, VA;

R is hydrogen, an inorganic radical or a C_1 to C_{50} organic radical; and

R_1 and R_2 are the same or different C_1 to C_{50} organic radical.

4. A lubricating composition comprising a major portion of a lubricating oil and a minor proportion of a boron-containing heterocyclic compound of the formula:



wherein:

y is an integer;

M is a metal;

R is hydrogen, an inorganic radical or C_1 to C_{50} organic radical; and

R_1 and R_2 are the same or different C_1 to C_{50} organic radical.

4,627,931

METHOD AND COMPOSITIONS FOR HARD SURFACE CLEANING

Arshad H. Malik, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jan. 29, 1985, Ser. No. 696,688

Int. Cl.[4] C11D *1/722, 3/33, 3/43*

U.S. Cl. 252—153 **12 Claims**

1. A liquid hard surface detergent composition comprising, on a total weight basis:

(a) from about 0.1 to about 50 weight percent of a nonionic surfactant component at least about 10 weight percent of which, on a total nonionic surfactant component weight basis, is a glycoside surfactant of the formula:

$$RO(R'O)_y(Z)_x \quad \text{I}$$

wherein R is a monovalent organic radical containing from about 6 to about 30 carbon atoms; R' is a divalent hydrocarbon radical containing from 2 to about 4 carbon atoms; y is a number having an average value of from 0 to about 12; Z is a moiety derived from a reducing saccharide containing 5 or 6 carbon atoms; and x is a number having an average value of from 1 to about 10;

(b) from about 0.1 to about 50 weight percent of a water miscible organic solvent selected from the group consisting of alkylene glycol ether solvents and polyalkylene glycol ether solvents;

(c) from about 0.1 to about 50 weight percent of a water soluble detergent builder; and

(d) from about 10 to about 99.7 weight percent water.

4,627,932

BICYCLIC AMIDE ACETALS AS MOISTURE SCAVENGERS

Anil B. Goel, Worthington, and Harvey J. Richards, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 4, 1985, Ser. No. 697,830

Int. Cl.[4] C09K *3/00*

U.S. Cl. 252—194 **4 Claims**

1. The method for removing water from mixtures of monohydroxyl vinyl monomers and water comprising adding to said mixtures a bicyclic amide acetal and allowing the water to react with the bicyclic amide acetal at a temperature in the range of from about room temperature up to about 200° C.

4,627,933

LIQUID CRYSTALLINE PHASES CONTAINING ALKYLENE-TYPE BRIDGES

Rudolf Eidenschink; Joachim Krause, both of Dieburg; Beatrice M. Andrews, South Humberside; George W. Gray, and Neil Carr, both of North Humberside, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany and The Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, Great Britain

Filed Jul. 7, 1983, Ser. No. 511,609

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225290

Int. Cl.[4] C07C *69/62, 69/612, 13/28, 43/205, 15/12, 25/18, 121/64, 121/60, 121/75;* **C09K** *3/34;* **G02F** *1/13;* **C07D** *319/06*

U.S. Cl. 252—299.6 **14 Claims**

1. A liquid-crystal dielectric useful for electro-optical display elements and comprising at least two liquid-crystal components, wherein at least one of the components is a compound of the formula

$$R^1—Q^1—(CH_2)_4—Q^2—R^2, \quad \text{(a)}$$

$$R^1—Q^1—(CH_2)_6—Q^2—R^2, \quad \text{(b)}$$

$$R^1—Q^1—CH_2—COO—CH_2—Q^2—R^2, \text{ or} \quad \text{(c)}$$

$$R^3—Cy—Phe—CH_2CH_2—COO—Phe—R^2 \quad \text{(d)}$$

wherein

R^1 and R^2 are each independently alkyl or alkoxy each of 1–12 C atoms, F, Cl, Br, CN or $—Q^3—R^3$, or one of R^1 and R^2 can also be H;

Q^1, Q^2 and Q^3 are each independently 1,4-phenylene (Phe), or 1,4-cyclohexylene (Cy), each of which is unsubstituted or substituted by 1–4 fluorine, chlorine or bromine atoms;

R^3 is alkyl or alkoxy each of 1–8 C atoms, H, F, Cl, Br or CN;

but with the proviso that in formula (a), Q^3 is unsubstituted 1,4-phenylene or 1,4-phenylene substituted by a fluorine, chlorine or bromine atom, only when at least one of R^1 to R^3 is F, Cl or Br or none of R^1 to R^3 is CN or two of the radicals R^1 to R^3 are CN.

4,627,934

SINGLE PHASE CLEAR LIQUID AFTER-SHAVE TREATMENT PRODUCT CONTAINING ALOE VERA

Jerome I. Lindauer, Hillsdale, N.J., and Sharon L. Reich, Briarwood, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jan. 25, 1985, Ser. No. 695,074

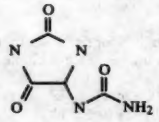
Int. Cl.[4] A61K *7/46*

U.S. Cl. 252—522 R **1 Claim**

1. A clear liquid phase, single phase composition consisting essentially of:

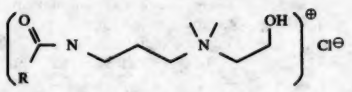
(i) from about 45 up to about 75% by weight of ethylalcohol;

(ii) from about 0.05% up to about 1.0% by weight of said composition of allantoin having the structure:



(iii) from about 2.0% up to about 5.0% of a poly lower alkylene glycol having a molecular weight of from about 8,000 up to about 20,000;

(iv) from about 0.2% up to about 1.0% of a quaternary ammonium salt having the structure:



wherein R is a Mink oil fatty acid residue;

(v) from about 0.75% up to about 3.50% of a polyalkoxylated lanolin oil which is lanolin oil bonded to 12 monomeric units of polypropylene glycol and 65 monomeric units of polyethylene glycol;

(iv) from about 2.0% up to about 5.0% of polypropylene glycol stearol ether;

(vii) from about 0.05% up to about 1.0% of polyalkylene glycol having a molecular weight of from about 8,000 up to about 20,000;

(viii) from about 20% up to about 40% by weight of said mixture of water;

(ix) from about 0.5% up to about 3.0% of a perfume oil; and

(x) from about 0.5% up to about 3.0% of aloe vera oil soluble fraction

said perfume oil being totally miscible with said aloe vera oil soluble fraction, said aloe vera oil soluble fraction produced according to the process comprising the steps of:

(a) forming aloe vera gel or a product resulting from steam distilling aloe vera leaves and separating the resulting oil phase from the resulting aqueous phase;

(b) extracting the oil miscible aloe vera fraction from the organic phase of the steam distillation product or from the aloe vera gel by intimately admixing therewith, a quantity of extraction solvent and physically separating the extract phase from the raffinate phase; and

(c) separating the extraction solvent from the oil miscible aloe vera extract phase.

4,627,935

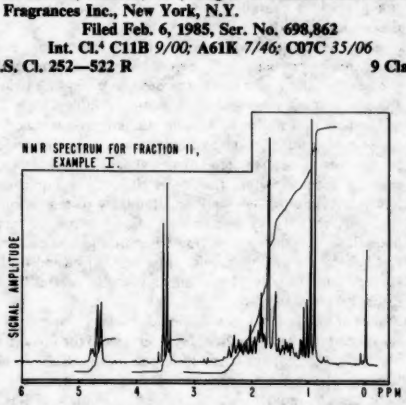
2-ISOPROPENYL-5-METHYLCYCLOPENTANEALKANOLS, ESTERS THEREOF AND ORGANOLEPTIC USES OF SAME

John B. Hall, Rumson, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

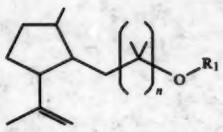
Filed Feb. 6, 1985, Ser. No. 698,862

Int. Cl.[4] C11B *9/00;* **A61K** *7/46;* **C07C** *35/06*

U.S. Cl. 252—522 R **9 Claims**



1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material, an aroma augmenting or enhancing quantity of at least one 2-isopropenyl-5-methylcyclopentanealkanols and esters thereof defined according to the structure:



wherein R_1 represents hydrogen or C_2–C_3 acyl and n represents 0 or 1.

4,627,936

TOWEL PREMOISTENED WITH ANTISTATIC SOLUTION FOR CLEANING CATHODE-RAY TUBES AND THE LIKE

Peter J. Gould, and Philip D. Turits, both of Greenwich, Conn., assignors to Gould Paper Corp., New York, N.Y.

Filed Oct. 5, 1984, Ser. No. 658,260

Int. Cl.[4] C11D *1/12, 1/755*

U.S. Cl. 252—558 **23 Claims**

1. An antistatic solution for cleaning cathode ray tubes or the like consisting essentially of

(a) from about 0.1 to 1 weight percent of a first surfactant of an alkali metal salt of an alkylated aryl disulfonate wherein the alkyl group has between 10 to 15 carbon atoms;

(b) from about 0.1 to 1 weight percent of a second surfactant of an alkylated aryl sulfonate wherein the alkyl group has between 10 to 15 carbon atoms; and

the balance of said composition constituting a liquid carrier comprising an alcohol, water and mixtures thereof.

4,627,937

PROCESS FOR DENITRATING NITRIC ACID AND ACTINIDE CONTAINING WASTE SOLUTIONS WHILE SIMULTANEOUSLY SEPARATING THE ACTINIDES

Klaus Gompper, Karlsruhe, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,798

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243841

Int. Cl.[4] G21F *9/04, 9/10;* **B01D** *21/01*

U.S. Cl. 252—631 **4 Claims**

1. Process for denitrating aqueous nitric acid and salt containing waste solutions in which actinides are present, while simultaneously separating the actinides, comprising: agitating the waste solution with diethyl oxalate at room temperature, and heating the resulting suspension to at least 75° C.

4,627,938

POLYMERIZATION INITIATOR

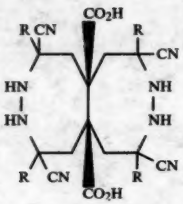
Barry D. Dean, Broomall, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 668,059, Nov. 5, 1984, Pat. No. 4,556,512. This application Jul. 29, 1985, Ser. No. 759,771

Int. Cl.[4] C07D *00/00*

U.S. Cl. 540-473 **1 Claim**

1. A compound having the formula



wherein each R separately represents a methyl or ethyl moiety.

4,627,939

P-FORMYL-N,N-DIPOLYOXYALKYLENESUBSTITUTEDANILINE

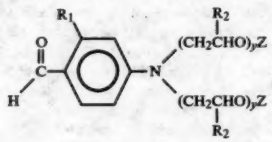
Patrick D. Moore, Spartanburg, and Robert L. Mahaffey, Jr., Inman, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 644,375, Aug. 27, 1984. This application Oct. 8, 1985, Ser. No. 785,628

Int. Cl.[4] C07C *95/08*

U.S. Cl. 260—404 **1 Claim**

1. A compound of the formula:



wherein R_1 is selected from an alkyl group having from one to about two carbon atoms, a halide group selected from chlorine, bromine or iodine, or an alkoxy group having from one to about two carbon atoms; R_2 is selected from H or an alkyl group having from one to about two carbon atoms; y is a number of from 2 to about 200; and Z is

where W is alkyl.

4,627,940

PROCESS FOR PREPARING A POLYAMIDE

Earl R. Beaver; J. Harvey Lester, Jr., and Thomas J. Thompson, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 29, 1982, Ser. No. 427,088

Int. Cl.[4] C07C *102/04*; C08G *69/26*

U.S. Cl. 260—501.11 **4 Claims**

1. In a process for the production of nylon salt from a dicarboxylic acid where the dicarboxylic acid is separated from the product stream in the form of wet crystals and where the dicarboxylic acid crystals, prior to shipment, are dried, loaded into a shipping container at one location, shipped to another location, and thereafter unloaded, mixed with sufficient amounts of water to form an aqueous dicarboxylic acid solution and then with aqueous diamine to form a nylon salt solution, the improvement comprising loading the wet dicarboxylic acid into the shipping container without prior drying; and unloading the dicarboxylic acid from the shipping container to a second container by feeding an aqueous solution of nylon salt into the shipping container, thereby entraining the wet dicarboxylic acid and concomitantly providing a solution of nylon salt and unreacted dicarboxylic acid, draining the salt-dicarboxylic solution from the shipping container, adding diamine to the drained salt-dicarboxylic solution in an amount to react with the unreacted dicarboxylic acid and continuously recirculating the resulting salt solution to the shipping container with subsequent further addition of diamine so as to dissolve and remove most of the dicarboxylic acid from the shipping container.

4,627,941

GAS/LIQUID CONTACTING APPARATUS

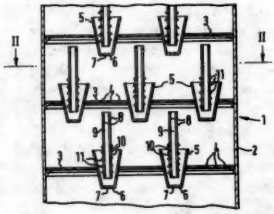
Jeremy B. Bentham, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 711,873, Mar. 14, 1985, abandoned. This application Apr. 18, 1986, Ser. No. 854,056

Claims priority, application United Kingdom, Mar. 14, 1984, 8406634

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—109 **7 Claims**



1. Gas/liquid contacting apparatus comprising:

a normally vertically extending column having a plurality of substantially horizontal trays arranged one above the other in the column;

each of said trays having a plurality of apertures for ascending gas and a plurality of liquid discharge devices for descending liquid;

said liquid discharge devices being open at their upper ends and extending at least partly below the relevant trays with the parts of the liquid discharge devices extending below the trays being provided with bottom walls which are pierced by bottom located liquid discharge openings;

each of said liquid discharge devices being also provided with a gas passage which (a) has at least one gas entry opening located within the lower part of the liquid discharge device, (b) has walls separated by distances such that the velocity of the upward flowing gas is small enough to permit liquid entrained in that gas to be separated from the gas by gravity flow and (c) has an outlet located substantially above the upper end of the liquid discharge device; and

the areas of said bottom located liquid discharge openings in said liquid discharge devices being arranged for providing an aggregate area sufficient for discharging all the liquid flowing downward through the column while maintaining within each liquid discharge device a column of liquid having a hydrostatic head sufficient to prevent said ascending gas from entering the liquid discharge devices through said bottom located liquid discharge openings, so that the discharging of liquid through the bottom located openings and the separating of liquid from gas within the gas passages maintains a substantially continuous and unhindered entry of liquid into the upper ends of the liquid discharge devices.

4,627,942

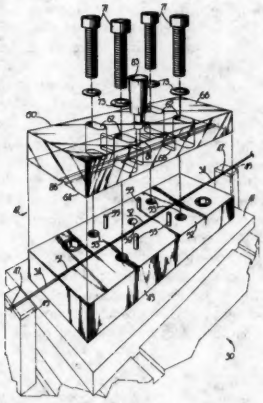
METHOD AND APPARATUS FOR RECOATING SPLICED END PORTIONS OF OPTICAL FIBERS

Paul F. Gagen, Duluth; Jane F. Kuhl, Atlanta; Stephen C. Mettler, Decatur, and Carl R. Taylor, Lawrenceville, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 27, 1985, Ser. No. 706,268

Int. Cl.[4] B29D *11/00*

U.S. Cl. 264—1.5 10 Claims



1. A method of recoating bared, spliced end portions of optical fibers, said method including the steps of:

positioning bared spliced end portions of optical fibers in a groove which opens to a surface of a base plate;

enclosing the groove with a cover which includes a channel and which engages the surface of the base plate;

introducing a curable coating material into the groove to encapsulate the bared spliced end portions of the optical fibers;

causing relative movement between the baseplate and the cover along the surface of the base plate to shear across the coating material in the groove to align the channel in the cover with the groove and thereby cause the coating material in the groove to have a free surface which is effective to allow a portion of the coating material to be substantially uninhibited during its contraction to facilitate redistribution of coating material and to avoid the formation of voids therein;

curing the coating material which encapsulates the spliced end portions of the fibers; and

removing the recoated spliced end portions form the groove.

4. An apparatus for coating a portion of an optical fiber, said apparatus including:

a mold plate which includes a groove for holding the portion of the optical fiber, said groove communicating with a surface of said mold plate;

cover means for enclosing the groove, said cover means including a channel which extends parallel to the groove;

injection means for introducing a coating material into the groove to encapsulate the portion of the optical fiber; and

means for mounting said cover means to facilitate relative movement between said mold plate and said cover means between one position whereat said injection means is aligned with the groove to permit introduction of the coating material into the groove and another position where the channel is aligned with the groove to allow the coating material to be cured while it is exposed to a free surface, the relative movement between the cover means and the mold plate between the two positions causing a shearing across the coating material along the surface of the mold plate to which the groove opens.

4,627,943

PROCESS FOR THE PRODUCTION OF SPHERICAL METALLIC PARTICLES

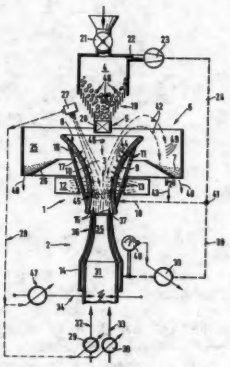
Wolfgang Seidler, Gartenweg 5, 4600 Dortmund 50, Fed. Rep. of Germany

Filed Dec. 11, 1984, Ser. No. 680,400

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1983, 3345983

Int. Cl.[4] B29B *9/10*

U.S. Cl. 264—14 16 Claims



1. In a process for the production of spherical metal particles for use as an abrasive wherein a particulate metal starting material is liquified and formed into molten droplets which are solidified by contact with a cooling gas, the improvement which comprises: passing the particulate starting material downwardly into an upward flowing stream of hot gas surrounded by a cooling envelope gas stream, the flow rate of the hot gas stream being sufficient to place the particles in a fluidized state creating a fluidized bed zone to which a magnetic field is applied and the temperature of the hot gas being sufficient to melt the particles.

4,627,944

METHOD FOR PRODUCING A CARBON SHEET AND A FUEL CELL SEPARATOR

Shigeru Murakami; Yasuto Komatsu, both of Omachi; Makoto Watanabe, Tokyo, and Takeo Uemura, Omachi, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,322

Claims priority, application Japan, Aug. 19, 1983, 58-150360

Int. Cl.[4] B29C *25/00;* C01B *31/02*

U.S. Cl. 264—29.4 6 Claims

1. A separator of a fuel cell produced by a method, comprising the steps of:

forming a shaped body in the form of a single sheet comprising cellulose fibers and a thermosetting resin which is filled between the cellulose fibers;

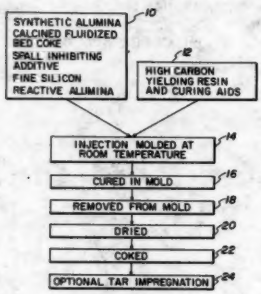
curing the thermosetting resin of the shaped body; and

baking the shaped body at a temperature of from 800 to 1200° C., thereby converting the thermosetting resin into carbon.

4,627,945
METHOD OF MANUFACTURING AN INJECTION MOLDED REFRACTORY SHAPE AND COMPOSITION THEREOF

Howard M. Winkelbauer, McKeesport; Ke-Chin Wang, Pittsburgh; Frank H. Walther, Jr., Upper St. Clair, and Donald F. Stock, Pittsburgh, all of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 27, 1984, Ser. No. 635,076
Int. Cl.[4] B29C 45/73
U.S. Cl. 264—29.5 10 Claims



1. A method for manufacturing an alumina-carbon shaped object comprising the steps of:

mixing 1–8 weight percent fine silicon, 1–16 weight percent reactive alumina, 1–30 weight percent calcined fluidized bed coke, 1–30 weight percent of a spall inhibiting additive, and the balance of the mix synthetic alumina with the additions of 5–10 weight percent of a high carbon yielding resin as a molding vehicle, 0.5–4 weight percent solvent and up to 2 weight percent of a low temperature curing agent;

injection molding the mix to produce shaped objects;

initially curing the shapes at a temperature less than 100° C.;

stripping the shape from the mold;

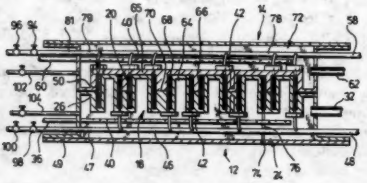
further curing the shape at a temperature above 100° C.; and

enhancing the strength of the shape by heating the shape at a relatively high temperature above 550° C. to promote coking of the resin molding vehicle.

4,627,946
METHOD AND MOLDING APPARATUS FOR MOLDING EXPANDED POLYSTYRENE ARTICLES HAVING SMOOTH SURFACES

Larry V. Crabtree, Kitchener, Canada, assignor to Morval-Durofoam Ltd., Ontario, Canada

Continuation-in-part of Ser. No. 548,957, Nov. 7, 1983, abandoned. This application Nov. 1, 1984, Ser. No. 667,067
Int. Cl.[4] C08J 9/22, 9/34
U.S. Cl. 264—51 22 Claims

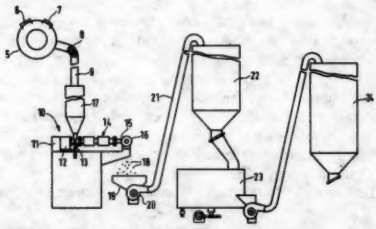


1. A method of forming an expanded plastic part of a predetermined shape from prefoamed resin beads comprising introducing prefoamed resin beads into a partially open mold cavity of said predetermined shape, said cavity being defined by inner surface of separable mold wall portions, said mold having a chamber defined exterior of and associated with each of said wall portions, a plurality of nozzles provided in at least one of said wall portions and a corresponding plurality of tubes interconnecting said nozzles to a manifold located in the corresponding chamber for fluid communication between the respective nozzle and manifold, said manifold being spaced from a corresponding said wall portion, each of said nozzles having an opening of cross-sectional area which is sufficiently small to preclude formation of evident surface marks on the formed part in the vicinity of each nozzle opening, introducing into said chamber a heating medium to heat said wall portions to a desired molding temperature with said cavity closed and filled with resin beads, injecting a pressurized steam from said manifold through said nozzles into said cavity to expand said resin beads until they fuse and form the desired part, said injection of said steam continuously removing from said manifold any condensate formed in said manifold through means in fluid communication with said manifold for providing a controlled continuous discharge of steam and condensate from said manifold, said manifold discharge means being provided on said manifold at its lowermost position when in use, removing said heating medium from said chambers and introducing into said chambers a cooling medium to cool said wall portions at least until said formed part has cooled sufficiently for removal, and opening said mold and removing the formed part from said cavity by separating said mold wall portions.

4,627,947
PROCESS FOR PRODUCING POURABLE SPHERICAL-SEGMENT-SHAPED PACKING MATERIAL PARTICLES MADE OF PLASTIC

Gerd Voss, Metzingen, Fed. Rep. of Germany, assignor to Storopack, Hans Reichenecker GmbH & Co., Metzingen, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 677,055
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422425
Int. Cl.[4] C08J 9/16, 9/14; B28B 9/02
U.S. Cl. 264—53 5 Claims



1. A process for producing pourable spherical-segment-shaped packing material particles made of an expanded plastic which have an external convex and an internal concave surface, where granules of plastic material containing an expanding agent are mixed with additives, such as cell-forming agents (nucleating agents), color pigments or similar substances, and by means of a feeding funnel, is fed into an extruder through an opening in a bush surrounding the extrusion screw, where the plastic material is plasticized in the course of the extruder and, because of the difference in speed existing over the cross section of the mass, comes out of an opening in the die with a bent surface, and the extruded plastic material is cut off directly at the opening of the die and before any considerable expansion has taken place, the improvement wherein a cell-forming agent (nucleating agent) having a grain size of less than about 40μ is uniformly distributed and adhered on the surface of the plastic

granules before their processing in the extruder in an amount less than 0.2 percent by weight based on the weight of said granules.

4,627,948

METHOD OF MANUFACTURING A SINTERED DOLOMITE IN A SHAFT KILN

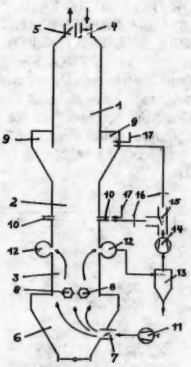
Karl H. Zepter, Mettmann; Dieter Opitz, Breitscheid; Alfred Roeder, Duisburg, and Max Chmiel, Hagen, all of Fed. Rep. of Germany, assignors to Dolomitwerke GmbH, Wulfrath, Fed. Rep. of Germany

Filed Mar. 8, 1983, Ser. No. 473,683

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209836

Int. Cl.⁴ C04B *33/32*

U.S. Cl. 264—56 **6 Claims**



1. In a method of manufacturing sintered dolomite having raw densities exceeding about 3.0 grams per cubic centimeter and total foreign oxide content of 1 to 3% by weight based on an initial ignition loss free mixture in a shaft kiln from ground raw dolomite briquetted or pelletized into shaped bodies, the steps comprising

deacidifying and heating said shaped bodies to a temperature of at least 1000° C. in an upper region of said shaft kiln in a preheating and deacidifying zone heated with fuels of a low thermal content,

thereafter sintering said shaped bodies in a lower sintering zone heated with fuels of high thermal content, so as to heat said shaped bodies to a temperature of about 1600° C. to about 2000° C.,

subsequently passing the sintered bodies into a lower cooling zone, and cooling said bodies therein, and, thereafter,

discharging said sintered bodies from said shaft kiln.

4,627,949

PROCESS FOR THE PREPARATION OF SHAPED ARTICLES OF STABILIZED POLYCARBONATE BY THE DEVOLATILIZING INJECTION-MOULDING OR DEVOLATILIZING EXTRUSION PROCESS

Rolf Dhein, Krefeld; Helmut M. Meier, Hattingen; Hans J. Meissner, Krefeld-Bockum; Klaus Kircher, Leverkusen, all of Fed. Rep. of Germany, and Udo Oels, Baytown, Tex., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,484

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3332065

Int. Cl.⁴ B28B *0/00*

U.S. Cl. 264—101 **2 Claims**

1. Process for the production of polycarbonate shaped articles by the devolatilizing injection-moulding or devolatilizing extrusion process, wherein the thermoplastic polycarbonate composition contains 0.1 to 0.1% of a phosphane of the general formula (I)

$$(R)_2PR^1 \qquad (I)$$

wherein

R is selected from the group consisting of unsubstituted C_6–C_{14}-aryl radicals, alkyl substituted C_6–C_{14}-aryl radicals and hydroxy substituted C_6–C_{14}-aryl radicals, and R^1 is selected from the group consisting of unsubstituted C_6–C_{14}-aryl radicals, unsubstituted C_1–C_{18}-alkyl radicals and substituted C_6–C_{14}-aryl and C_1–C_{18}-alkyl radicals wherein substitutes are any of hydroxy, alkyl-carboxyl, cyano or phenyl radicals.

4,627,950

METHOD OF PRODUCING ABRASIVE FIBERS

Masao Matsui, Takatsuki; Hiroshi Naito, and Takao Osagawa, both of Osaka, all of Japan, assignors to Kanebo, Ltd., Tokyo and Kanebo Synthetic Fibers, Ltd., Osaka, both of Japan

Filed Apr. 24, 1985, Ser. No. 726,526

Int. Cl.⁴ D02G *1/20*

U.S. Cl. 264—103 **22 Claims**

1. A method of producing abrasive fibers, which comprises providing a conjugate fiber comprising at least one abrasive layer composed of a polymer containing at least 20% by weight of abrasive particles and at least one coating layer substantially covering the abrasive layer, said coating layer being composed of a polymer containing substantially no abrasive particles, and removing at least a part of the coating layer from the conjugate fiber with a solvent or a decomposer to expose at least a part of the abrasive layer from the coating layer.

4,627,951

PROCESS FOR MANUFACTURING COMPOSITE PRODUCTS FROM LIGNOCELLULOSIC MATERIALS

Kuo C. Shen, Ottawa, Canada, assignor to K. C. Shen Technology International Ltd., Ottawa, Canada

Filed Mar. 30, 1983, Ser. No. 480,570

Int. Cl.⁴ B32B *5/16*

U.S. Cl. 264—109 **9 Claims**

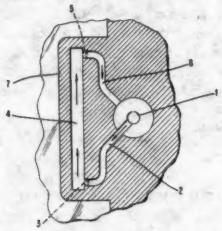
1. A process for making waterproof composite products from comminuted sugar containing lignocellulosic materials without the addition of adhesive binders or chemical catalysts or high pressure steam, which comprises the steps of separating the raw materials into particles, fibres, strands, and flakes, drying the comminuted raw materials, forming the previously dried raw materials into a desired mat, pressing the mat in an open pressing step, and heating the formed mat at a temperature of 180° C. or higher and a pressure and a time sufficient to consolidate said mat into a molded article, while the adhesive bond is developed and thermoset in situ, transforming and polymerizing sugars and water soluble materials into an insoluble and infusible crosslinked substance as bonding and bulking agent which is resistant to boiling water and to acid hydrolysis, wherein the sugars and water soluble materials contain lignocellulosic materials and are selected from sugar cane stalks, sorghum stalks, corn stalks, and sun flower stalks.

4,627,952

INJECTION MOLDING PROCESS

Zohar Ophir, Haifa, Israel, assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 414,558, Sep. 3, 1982, abandoned. This application Jan. 7, 1985, Ser. No. 689,326
Int. Cl.[4] B29C 45/76
U.S. Cl. 264—328.12 18 Claims



1. An improved process for injection molding thermotropic liquid crystalline polymer, comprising the steps of:

a. providing a molten stream of thermotropic liquid crystalline polymer;

b. injecting said molten stream so as to flow in substantially laminar fashion through an inlet communicating with an upstream end of a cavity in a mold and into said cavity;

c. allowing a portion of said molten stream to flow through an outlet communicating with said cavity at the downstream thereof, so as to allow molten material to flow out of said cavity while said cavity is being filled in order to minimize rebound molecular wave motion in said molten material within said cavity and substantially preserve said laminar flow;

d. continuing to allow said molten stream to flow out of said cavity during the entire filling of said cavity with said molten stream so as to continue to minimize rebound molecular wave motion in said molten material within said cavity and substantially preserve said laminar flow; and

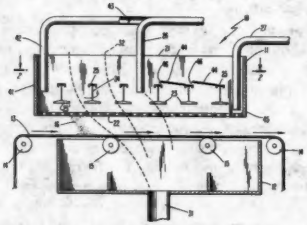
e. solidifying said molten material present in said cavity into a molded article.

4,627,953

METHOD FOR FORMING DRY LAID WEBS

Jeffrey J. Johnson, Lynchburg, Va., assignor to The James River Corporation, Conn.

Division of Ser. No. 460,986, Jan. 25, 1983, Pat. No. 4,482,308. This application Oct. 10, 1984, Ser. No. 659,522
Int. Cl.[4] B27N 3/04
U.S. Cl. 264—518 9 Claims



1. A method for forming dry laid non-woven webs on a foraminous wire moving horizontally in an upstream-to-downstream direction substantially free of cross-machine ripples at forming speeds of greater than 500 feet per minute comprising:

introducing fibers into a distributor disposed above the foraminous wire for downward dispersion of said fibers onto the moving foraminous wire, said fibers being introduced proximate the upstream end of the distributor relative to the moving wire;

inducing a pressure gradient in the downstream direction by means of a suction box disposed beneath the foraminous wire offset in a downstream direction relative to the distributor and drawing air through a top end of the distributor; and

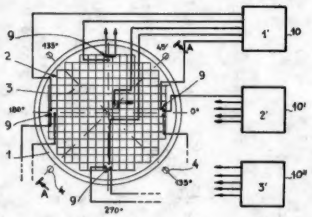
creating a zone of reduced pressure within the distributor in the downstream end of the distributor by use of baffling within the distributor to impart an increased horizontal velocity component to the fibers being dispersed upon the foraminous wire sufficient to substantially avoid said cross-machine ripples.

4,627,954

PROCESS FOR DETECTING FAULTS IN THE POWER DISTRIBUTION OF A PRESSURIZED WATER NUCLEAR REACTOR CORE AND DEVICE FOR MAKING USE OF THIS PROCESS

Jean Leroy, Gif-sur-Yvette, and Pierre Ruiz, Blanc Mesnil, both of France, assignors to Framatome & Cie., Courbevoie, France

Filed May 7, 1984, Ser. No. 607,472
Claims priority, application France, May 19, 1983, 83 08276
Int. Cl.[4] G21C 7/36
U.S. Cl. 376—216 9 Claims



1. Process for detecting faults in the distribution of the core power of a pressurized water nuclear reactor, comprising the steps of

(a) measuring at least one parameter representing the power of the core at a predetermined number of points in different radial positions with reference to said core;

(b) determining for each parameter the difference between two extreme measured values (12 and 12'; 29 and 30) and the ratio (16; 34) of this difference to the smallest measured value (12'; 30);

(c) comparing this ratio (16; 34) to a set value, a fault being detected if this ratio (16; 34) is greater than said set value.

4,627,955

PROCESS FOR DETECTING THE VARIATIONS IN THE REACTIVITY OF THE CORE OF A PRESSURIZED WATER NUCLEAR REACTOR AND DEVICE FOR MAKING USE OF THIS PROCESS

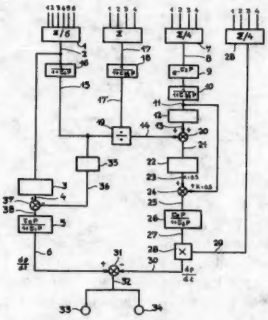
Jean Leroy, Gif-Sur-Yvette, and Pierre Ruiz, Blanc Mesnil, both of France, assignors to Framatome & Cie., Courbevoie, France

Filed May 7, 1984, Ser. No. 607,474
Claims priority, application France, May 19, 1983, 83 08275
Int. Cl.[4] G21C 7/36
U.S. Cl. 376—216 5 Claims

1. Process for detecting the variations, due to a fault in the position of the core control clusters, in the reactivity of the core of a pressurized water nuclear reactor having at least one cooling loop, comprising the steps of

(a) measuring the core neutron power by means of neutron flux measuring chambers outside said core;

(b) calculating from said measured core neutron power an instantaneous value of the reactivity of said reactor;
(c) measuring the mean temperature in said core;
(d) measuring the mean boron concentration in the primary fluid passing through said core,
(e) calculating from said measured mean temperature and



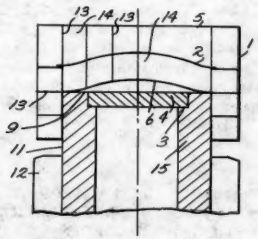
mean boron concentration a second instantaneous value representing the reactivity of said reactor; and
(f) comparing said first instantaneous value of the reactivity to the second instantaneous value of said reactivity for detecting a fault in the position of the core control clusters, in the case where said values of reactivity are different.

4,627,956

SHOCK ABSORBERS

Werner Botzem, Alzenau, and Elmar Schlich, Gründau, both of Fed. Rep. of Germany, assignors to Transnuclear GmbH, Hanau, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 306,643, Sep. 29, 1981, abandoned. This application Feb. 15, 1984, Ser. No. 580,359
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1980, 3037328
Int. Cl.[4] G21F *5/00*; G21C *19/00*
U.S. Cl. 376—272 **2 Claims**



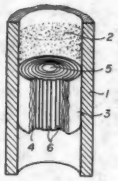
1. In a transportation, storage container having an end portion surrounding an opening, a cover for said opening, a rim on said end portion with said cover spaced inwardly from said rim, with said rim constituting a bearing surface, a shock absorber means comprising a body for attachment to said end and over said cover, said body having an outer wall which extends along at least a portion of the side of the container when said shock absorber means is disposed on said end of said container, said body having an inner surface which faces the container cover and which is out of contact with said cover, said body including a plurality of cup-shaped, resilient sheets, each having a curvature bending away from said end when said shock absorber means is placed on said end of said container, each said sheet being spaced from an adjacent sheet along a central axis, one of said sheets being disposed adjacent said end of said container and having an outer periphery in sliding engagement with said bearing surface of said end of said container, said outer periphery being movable with respect to said body of said shock absorber into said sides of said shock absorber, said one sheet providing a space between said cover and said one sheet when said shock absorber means is attached to said container end, said shock absorber means further including wall means defining a plurality of chamber means, including between said sheets, each filled with shock absorbing material.

4,627,957

NUCLEAR FUEL ROD WITH POROUS PLUG CLOSURE

Richard W. Stratton, Windisch; Michel Nicolet, Baden, and Glenn Andrews, Grand-Lancy, all of Switzerland, assignors to Gesellschaft zur Forderung der Industrieorientierten Forschung an den Schweizerischen Hochschulen und Weiteren Institutionen, Berne, Switzerland

Continuation of Ser. No. 320,099, Nov. 10, 1981, abandoned. This application Aug. 31, 1984, Ser. No. 647,251
Claims priority, application Switzerland, Jan. 20, 1981, 348/81
Int. Cl.[4] G21C *3/18*
U.S. Cl. 376—412 **5 Claims**



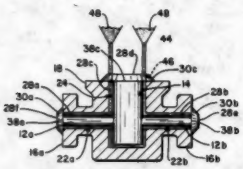
1. A nuclear fuel rod comprising:
a metal cladding tube;
a body of nuclear fuel in said tube in the form of particles; and
a porous plug closing at least one end of said tube and comprising:
a central pin, and
a metal non-porous strip, spirally wound around said pin in a tightened coil, the adjacent turns of which being freely slidable against each other under intrinsic elasticity of said tightened coil, the diameter of which corresponding substantially to the inside diameter of said cladding tube so that the said tightened coil can be fitted into said cladding tube and maintained in a tightened coil by the wall of said tube, said tightened coil being elastically expanded by sliding of said turns when the inside diameter of said tube thermally expands by heating, said strip being formed on at least one surface with channels defining a plurality of passages extending in an axial direction with respect to said tube between successive turns, said passage each having a maximum radial dimension of about 20 microns and at least one of the dimensions of the cross section of said passages being smaller than the size of the finest particles of the fuel.

4,627,958

DENSIFICATION OF METAL POWDER TO PRODUCE CLADDING OF VALVE INTERIORS BY ISODYNAMIC COMPRESSION

Charles Hays, Pearland, Tex., assignor to Gray Tool Company, Houston, Tex.

Filed Dec. 27, 1983, Ser. No. 565,434
Int. Cl.[4] B22F *7/00*
U.S. Cl. 419—8 14 Claims



1. A method for cladding the interior cavity walls of a metal article by a process which utilizes loose metal powder and an inert, vitreous pressure transmitting medium of variable rheological state, comprising the steps of:

(a) forming a solid inert member of said vitreous medium, generally conforming in shape to the cavity walls;

(b) fixturing the insert member within the cavity to provide a generally concentric, annular space of predetermined distance between the insert member and the adjacent walls to be clad, and to expose an exterior surface of the insert member;

(c) sealing the exposed surface of the insert member against the article to form a closed activation volume including said annular space;

(d) selecting a metal powder blend having a known densification temperature-pressure relationship and filling the activation volume to the tap density of said powder blend;

(e) evacuating the activation volume to remove undesired impurities in the blend, and sealing the activation volume to form a loaded article ready for densification from powder to clad;

(f) heating the loaded article to a process temperature T at which the insert member becomes pliable, and which satisfies the condition $0.5\ T_m<T<T_m$ where T_m is the melting temperature of the powder blend;

(g) applying a substantially uniform pressure to the exterior surface of the insert member while at temperature T, to cause a rheological flow of the insert member whereby an isodynamic pressure is applied to said activation volume sufficient to compress and densify the powder blend to form a bonded clad deposit;

(h) cooling the loaded article and removing the insert member from the cavity.

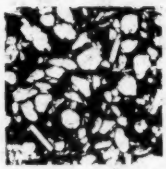
4,627,959

PRODUCTION OF MECHANICALLY ALLOYED POWDER

Paul S. Gilman, Suffern, N.Y., and Walter E. Mattson, West Milford, N.J., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Jun. 18, 1985, Ser. No. 745,890
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—61 30 Claims

1. A method for the production on a commercial scale of a mechanically alloyed powder product, said powder product being characterized in that it has or can be converted on heating to a substantially uniform chemical composition and microstructure, said powder product being convertible to an end product having predetermined properties and said powder being produced by dry, impact milling particulate components for the powder product in the presence of a predetermined amount of process control agent, said method comprising determining the duration of time to produce a powder product having an apparent density of at least about 25% of the fully compacted density of the powder as compacted and extruded, the apparent density being determined according to ASTM Test No. B 212-48 (for flowable powder) or No. B 417-64 (for non-free-flowing powder), using said determination of the duration of time to obtain said apparent density in determining



the duration of time for impact milling of the particulate components; whereby the mill throughput is maximized and an acceptable processing level is obtained for the powder product, said acceptable processing level being one criterion for determining whether the powder product is suitable for producing an end product capable of having the predetermined properties.

4,627,960

COPPER-BASED ALLOY

Takashi Nakajima, and Kenji Kubosono, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1985, Ser. No. 699,894
Int. Cl.[4] C22C *0/9;* H01L *23/48*
U.S. Cl. 420—472 2 Claims

1. A copper-based alloy consisting essentially of 1.2 to 2.5 wt% tin, 0.07 to 0.15 wt% phosphorous, 0.01 to 0.6 wt% nickel, 0.05 to 1 wt% zinc, and the remainder being copper and minute amounts of unavoidable impurities, said alloy being substantially free of manganese.

4,627,961

CALCIUM-ALUMINUM BRIQUETTES

David M. Dudek, Great Barrington, Mass., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 4, 1985, Ser. No. 772,293
Int. Cl.[4] C22C *11/02*
U.S. Cl. 420—564 3 Claims

1. A calcium-aluminum briquette which comprises a mechanically compressed mixture of 65 to 80% by weight of calcium granules and 20 to 35% by weight of aluminum granules.

4,627,962

PROCESS AND APPARATUS FOR REDUCING THE CHANCES OF IGNITION AND EXPLOSION FROM THE DECOMPOSITION OF HIGH PRESSURE INDUSTRIAL PROCESS ETHYLENE GASES

Daniel Grasset, Saint Nicolas de la Taille, and Bernard Martinot, Lillebonne, both of France, assignors to Societe Chimique des Charbonnages--CdF Chimie, Paris, France

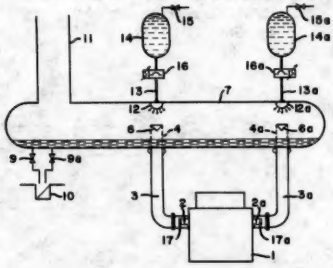
Division of Ser. No. 406,997, Aug. 10, 1982, Pat. No. 4,534,942, which is a continuation of Ser. No. 143,631, Apr. 25, 1980, abandoned. This application May 31, 1985, Ser. No. 739,845
Claims priority, application France, Apr. 25, 1979, 79 10442
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.[4] G05B *9/00;* C08F *2/34;* C08G *85/00*
U.S. Cl. 422—40 12 Claims

1. A process for reducing the chances of ignition and explosion resulting from the decomposition of ethylene in a high-pressure vessel operating at a pressure of at least 100 bars,

comprising evacuating said decomposition gases of ethylene into an apparatus adjacent to said vessel, said apparatus comprising:

(a) means defining a reservoir with a volume between 2 and 100 times that of the vessel;

(b) conduit means connecting and communicating said vessel to said reservoir means and having at least one safety means separating said apparatus from said vessel for releasing said decomposition gases from said vessel, said conduit means being located at least in part outside of both



said vessel and said reservoir means whereby said vessel and said reservoir means are in a spaced-apart relationship, said conduit means constituting means for passing said decomposition gases released from said vessel to said reservoir means;

(c) at least one vertically oriented chimney connecting the reservoir means to the atmosphere; and

(d) a sealing means across the entire cross-section of said chimney, whereby an inert atmosphere is provided within said chimney.

4,627,963

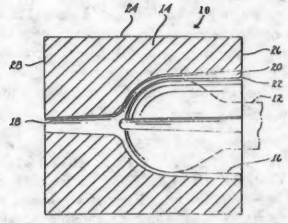
HEAT ACTIVATED DISPENSER AND METHOD OF DISPENSING A VAPOR THEREFROM

Donald M. Olson, Scottsdale, Ariz., assignor to LAD Technology, Inc., Phoenix, Ariz.

Filed Feb. 29, 1984, Ser. No. 584,826

Int. Cl.[4] A61L *9/03*

U.S. Cl. 422—125 **20 Claims**



1. A heat activated vapor dispenser comprising:

a volume of diatomite compacted under high pressure into a shape constructed so as to accept heat from a heat source and having at least one surface to be oriented towards the heat source, further having at least one surface to be oriented away from the heat source; and

a vaporizable material to be dispensed, charged into volume.

4,627,964

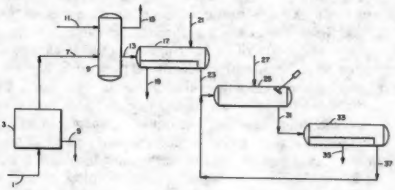
PROCESS FOR THE REMOVAL OF HYDROGEN SULFIDE FROM SOUR GAS

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 10, 1985, Ser. No. 786,415

Int. Cl.[4] C01B *17/16, 31/20*

U.S. Cl. 423—228 **25 Claims**



1. A process for removing hydrogen sulfide from sour gas and arsenic from shale oil produced during oil shale retoring comprising:

(a) decomposing said oil shale in a retort thereby forming a sour gas containing hydrogen sulfide and a shale oil containing arsenic;

(b) introducing into the retort at retoring temperatures an aqueous ammonia or amino compound solution in an amount sufficient to react with hydrogen sulfide in said sour gas and arsenic in said shale oil; and

(c) separating the generated shale oil into an aqueous layer and an oil layer and washing said oil layer with water thereby removing said hydrogen sulfide, substantially removing said arsenic and cooling said shale oil.

4,627,965

METHOD OF DESULFURIZING INDUSTRIAL FLUE GASES

Karl-Rudolf Hegemann, Essen-Bergerhausen, and Ulrich Kleeberg, Mühlheim/Ruhr, both of Fed. Rep. of Germany, assignors to Gottfried Bischoff Bau Kompl. Gasreinigungsund Wasserrückkühlanlagen GmbH & Co., Essen, Fed. Rep. of Germany

Continuation of Ser. No. 640,704, Aug. 14, 1984, abandoned. This application Jan. 31, 1986, Ser. No. 824,933

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329633

Int. Cl.[4] C01B *17/00*

U.S. Cl. 423—242 **2 Claims**

1. A method of desulfurizing an industrial flue gas which comprises the steps of:

(a) providing a scrubbing colum defining (i) in an upper region of said column a scrubbing zone of predetermined length traversed by a plurality of atomizing nozzles arranged in a plurality of vertically spaced multinozzle tiers having separate control valves for selective blocking of fluid access thereto, and (ii) in a lower region of said column an oxidation zone below said scrubbing zone;

(b) spraying a scrubbing liquid including calcium carbonate in aqueous solution into said upper region of said column through at least one selected tier of said nozzles, under pressure of a pump communicating with said nozzles, to form atomized droplets of said scrubbing liquid of a predetermined mean droplet size moving downwardly through said scrubbing zone;

(c) passing said flue gas upwardly through said scrubbing zone in countercurrent flow to said droplets of said scrubbing liquid while, with reference to the mean droplet size, the rate of flow of said flue gas through said scrubbing zone and the length of the latter, controlling the mean residence time of said droplets in said scrubbing zone by regulating said pump pressure and by selectively activat-

ing said control valves to permit the flow of said scrubbing liquid to and through said at least one tier of said nozzles, for effecting an uptake of sulfur dioxide by said droplets from said flue gas, during the movements of said flue gas and said droplets through said scrubbing zone, sufficient to impart to said scrubbing liquid in said droplets a pH between 3 and 6, whereby calcium sulfite and calcium hydrogen sulfite form and collect in a body of said scrubbing liquid in said lower region of said column and said body of said scrubbing liquid has the same pH between 3 and 6 as said droplets of said scrubbing liquid;

(d) oxidizing the calcium sulfite and calcium hydrogen sulfite in said body of said scrubbing liquid in said oxidation zone at said same pH to form calcium sulfate;

(e) introducing calcium carbonate into said body of said scrubbing liquid in said lower region of said column; and

(f) circulating said scrubbing liquid by means of said pump from said lower region of said column to said at least one tier of said nozzles and therethrough into said scrubbing zone in the form of said atomized droplets of said scrubbing liquid.

4,627,966

FORMATION OF FINE PARTICLE SINTERABLE CERAMIC POWDERS

Adolph L. Micheli, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 591,177, Mar. 19, 1984, abandoned. This application Apr. 10, 1986, Ser. No. 850,028

Int. Cl.[4] C01F *17/00*; C01G *25/02*

U.S. Cl. 423—263 **3 Claims**

1. A method of preparing a sinterable metal oxide ceramic precursor powder, comprising

mixing an aqueous solution of polyvalent metal cations of one or more metals taken from the group consisting of yttrium and zirconium with an aqueous solution of ammonium polyacrylate to form a metal polyacrylate precipitate,

separating the precipitate from the aqueous mother liquid,

burning out the organic portion of the precipitate, and

calcining the ash to form a sinterable ceramic percursor powder.

4,627,967

PHOSPHAZENE TRIMER PURIFICATION

W. Dirk Klobucar, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 5, 1984, Ser. No. 658,307

The portion of the term of this patent subsequent to Jul. 29, 2003, has been disclaimed.

Int. Cl.[4] C01B *25/10*

U.S. Cl. 423—300 **20 Claims**

1. A process for purifying impure cyclic phosphonitrilic chloride to obtain polymerization grade trimer said process comprising:

(a) crystallizing cyclic phosphonitrilic chloride trimer from a solution of impure phosphonitrilic chloride trimer in an inert solvent;

(b) separating said crystallized trimer from said inert solvent; and

(c) distilling the separated crystalline trimer to obtain polymerization grade trimer.

4,627,968

SYNTHESIS OF CRYSTALLINE ALUMINOSILICATE WITH ALKYLUREA OR ALKYLTHIOUREA

Tadashi Kai, Machida, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 10, 1985, Ser. No. 774,454

Claims priority, application Japan, Sep. 10, 1984, 59-188165

Int. Cl.[4] C10B *33/28*

U.S. Cl. 423—329 **10 Claims**

1. A process for synthesizing a crystalline aluminosilicate, which comprises heating an aqueous mixture containing a silica source, an alumina source and an alkali metal source in the presence of at least one compound selected from the group consisting of lower alkylureas and lower alkylthioureas.

4,627,969

PRODUCTION OF CHLORINE DIOXIDE

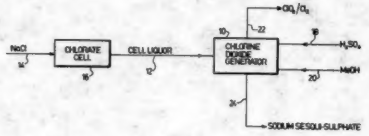
Maurice C. J. Fredette, and Ching-Shi Yang, both of Mississauga, Canada, assignors to Tenneco Canada Inc., Islington, Canada

Filed Sep. 13, 1984, Ser. No. 649,923

The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.

Int. Cl.[4] C01B *11/02, 11/14*

U.S. Cl. 423—478 **10 Claims**



1. A process for the production of chlorine dioxide, which comprises:

feeding to a reaction zone an aqueous solution of sodium chlorate and sodium chloride having a concentration of about 3.5 to about 6.5 molar $NaClO_3$ and a concentration of about 3.5 to about 1 molar NaCl,

feeding methanol to the reaction zone,

feeding sulphuric acid to the reaction zone,

said feeds of sulphuric acid, methanol, and aqueous solution of sodium chlorate and sodium chloride being fed at rates and in concentrations sufficient to provide, in said reaction zone, an aqueous reaction medium having a total acid normality of about 7 to about 12 normal and a chlorate ion concentration of about 0.5 to about 3.5 molar, and to generate chlorine dioxide and chlorine at high efficiency from said reaction medium at least about 50% by reaction between the fed sodium chlorate, methanol and sulphuric acid and up to about 50% by reaction between the fed sodium chlorate, sodium chloride and sulphuric acid,

said reaction medium having a chloride ion concentration of about 0.001 to about 0.3 molar resulting from but not controlled by the feed rate of said aqueous solution of sodium chlorate and sodium chloride to said reaction zone,

maintaining said reaction medium at its boiling point under a subatmospheric pressure applied to the reaction zone,

removing said generated chlorine dioxide and chlorine from the reaction zone in gaseous admixture with steam, and

precipitating a sodium acid sulphate comprising sodium sesquisulphate from the reaction medium once the reaction medium becomes saturated therewith after start up.

4,627,970

METHOD OF TREATMENT OF SLUDGE FROM A FLUE GAS DESULFURIZATION PLANT

Berthold Krüger, Herne, Fed. Rep. of Germany, assignor to Gottfried Bischoff Bau Kompl. Gasreinigungsund Wasserrückkühlanlagen GmbH & Co., Essen, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 715,189

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414822

Int. Cl.[4] C01F *1/46*; C01B *17/00*; B01D *37/02*; C02F *1/00*

U.S. Cl. 423—555 **5 Claims**

1. A method of treating a desulfurization sludge containing a solids component rich in calcium sulfate and an aqueous liquid component containing soluble precipitatable impurities from

the scrubbing of a flue gas and forming a liquid phase, said method comprising the steps of:

(a) dewatering said desulfurization sludge to form a thin layer of said solids component;

(b) washing said thin layer of said solids component in at least one washing stage with fresh water;

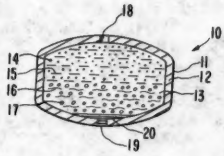
(c) neutralizing said liquid phase to precipitate out said precipitatable impurities; and

(d) collecting said precipitatable impurities on said thin layer of said solids component before the washing thereof with fresh water but after the thin layer has been formed in step (a).

4,627,971
OSMOTIC DEVICE WITH SELF-SEALING PASSAGEWAY

Atul D. Ayer, Mt. View, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Filed Apr. 22, 1985, Ser. No. 725,832
Int. Cl.[4] A61K *9/26, 9/24;* **A61J** *3/00*
U.S. Cl. 424—15 **2 Claims**



1. An osmotic dispensing device for delivering a beneficial medicine formulation to an environment of use, comprising:

(a) a wall comprising at least in part a semipermeable composition permeable to the passage of an exterior fluid present in the environment of use and substantially impermeable to the passage of the beneficial medicine formulation, which wall surrounds and forms:

(b) a compartment;

(c) a first passageway in the wall;

(d) a second passageway in the wall;

(e) a first layer comprising a beneficial medicine formulation in the compartment communicating with the first passageway;

(f) a second layer comprising an expandable osmopolymer in the compartment, said second layer in communication with the second passageway; and

(g) means possessing the ability to flow, form a film and seal the second passageway in the second layer for closing the second passageway during manufacture of the osmotic device.

4,627,972
EFFERVESCENT DENTIFRICE

Anthony J. Gioffre, Ridgefield, Conn., and Ronald J. Ross, Upper Nyack, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 16, 1984, Ser. No. 672,351
Int. Cl.[4] A61K *7/16, 9/46, 9/12, 7/18*
U.S. Cl. 424—44 **23 Claims**

1. An effervescent dentifrice composition which upon contact with water provides an effervescent action wherein said effervescent dentrifice composition comprises a dry aluminum collapsible tube and extrudable tubed dessicated dental cream formulation of between about 1 and about 99 percent by weight inorganic oxide material and an anhydrous dentifrice base medium admixed and blended under a CO_2 or N_2 atmosphere with an effective amount of a gas-containing inorganic oxide dehydrated material containing an effective amount between about 1 and about 25 percent by weight of at least one adsorbed gas selected from the group consisting of nitrogen, oxygen, helium, argon, fluorine, chlorine and carbon dioxide wherein said inorganic oxide material is at least one inorganic oxide material selected from the group consisting of zeolites, aluminophosphates and silicoaluminophosphates.

4,627,973
SKIN MOUSSE

Robert P. Moran, Elmwood Park, and Edward P. Carhart, Jr., Cliffwood Beach, both of N.J., assignors to Charles of the Ritz Group Ltd., New York, N.Y.

Filed Dec. 14, 1984, Ser. No. 681,529
Int. Cl.[4] A61K *7/00*
U.S. Cl. 424—47 **6 Claims**

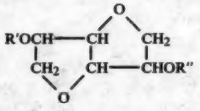
1. A method for enhancing stability of a moisturizer or fragrance mousse, which mousse include an effective amount of a hydrocarbon propellant, which comprises incorporating therein a mixture of acetylated lanolin alcohol, an alkoxylated methyl glucose derivative and an alkoxylated lanolin derivative, wherein said alkoxylated methyl glucose derivative is present in an amount within the range from about 0.1 to about 3% by weight of said mousse and is selected from the group consisting of polypropylene glycol-20 methyl glucose ether, polyethylene glycol-10 methyl glucose ether, and polyethylene glycol-20 methyl glucose ether, said alkoxylated lanolin derivative is present in an amount within the range of from about 1 to about 5% by weight of said mousse and is selected from the group consisting of polyethylene glycol-85 lanolin, polyethylene glycol-75 lanolin, polyethylene glycol-40 lanolin, and polyethylene glycol-27 lanolin, and said acetylated lanolin alcohol is present in an amount within the range of from about 1 to about 5% by weight of the said mousse and is the acetyl ester of lanolin alcohol.

4,627,974
DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE PLAQUE ACCUMULATION AND IRRITATION

Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649. This application Dec. 27, 1985, Ser. No. 813,842
Int. Cl.[4] A61K *9/68*
U.S. Cl. 424—48 **8 Claims**

1. A method for inhibiting the formation of plaque and calculus on relieving throat irritation in the oral cavity of mammals which comprises periodically treating the surfaces of the throat, mouth, teeth and gums by chewing a chewing gum composition containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula:



wherein R' and R" are individually selected from alkyl radicals selected from the group consisting of $—CH_3$, $—C_2H_5$, $—C_3H_7$, $—C_4H_9$ or —H when other R' or R" is an alkyl radical of 1-4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

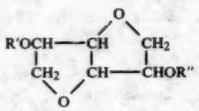
4,627,975

DENTAL FLOSS DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE PLAQUE ACCUMULATION AND IRRITATION

Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649.
This application Dec. 27, 1985, Ser. No. 814,045
Int. Cl.[4] A61K 7/16, 9/68
U.S. Cl. 424—49 7 Claims

1. A method for inhibiting the formation of plaque and calculus in the oral cavity of mammals which comprises periodically treating the surfaces of the teeth and gums by flossing the teeth with dental floss containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula:



wherein R' and R" are individually selected from alkyl radicals selected from the group consisting of —CH_3, —C_2H_5, —C_3H_7, —C_4H_9 or —H when the other R' or R" is an alkyl radical of 1–4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

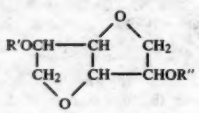
4,627,976

DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE PLAQUE ACCUMULATION AND IRRITATION

Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649.
This application Dec. 27, 1985, Ser. No. 814,118
Int. Cl.[4] A61K 7/16
U.S. Cl. 424—49 8 Claims

1. A method for inhibiting the formation of plaque and calculus in the oral cavity of mammals which comprises periodically treating the surfaces of the teeth and gums with a toothpaste gel containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula:



wherein R' and R" are individually selected from alkyl radicals selected from the group consisting of —CH_3, —C_2H_5, —C_3H_7, —C_4H_9 or —H when the other R' or R" is an alkyl radical of 1–4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

4,627,977

ANTICALCULUS ORAL COMPOSITION

Abdul Gaffar, Princeton, and Thomas G. Polefka, Somerset, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 13, 1985, Ser. No. 775,851
Int. Cl.[4] A61K 7/16, 7/18, 9/68
U.S. Cl. 424—52 11 Claims

1. A method of inhibiting dental calculus comprising applying to teeth a calculus-inhibiting amount of a dentifrice composition having a pH of about 4.5 to about 9 containing, in an orally acceptable vehicle, approximately by weight, 0.1 to 7% of one or a mixture of linear molecularly dehydrated polyphosphate salts selected from the group consisting of water soluble alkali metal pyrophosphates, tripolyphosphates and hexametaphosphates, a dentally acceptable silica polishing material, and for the purpose of inhibiting hydrolysis of P-O-P bonds in said polyphosphate salts by phosphatase enzymes in saliva to orthophosphates which are relatively ineffective as inhibitors of hydroxyapatite formation, an amount of a fluorine ion source sufficient to supply 25 ppm. to 2,000 ppm. of fluoride ions and 0.05% to 3% of a water-soluble alkali metal or ammonium synthetic anionic linear polymeric polycarboxylate salt having a molecular weight of about 1,000 to about 1,000,000 said composition when so applied to teeth being effective to inhibit dental calculus.

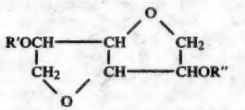
4,627,978

TOOTH DROP DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE PLAQUE ACCUMULATION AND IRRITATION

Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649.
This application Dec. 27, 1985, Ser. No. 814,112
Int. Cl.[4] A61K 7/16, 9/68, 7/22
U.S. Cl. 424—54 8 Claims

1. A method for inhibiting the formation of plaque and calculus in the oral cavity of mammals which comprises periodically treating the surfaces of the teeth and gums with tooth drops containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula:



wherein R' and R" are individually selected from alkyl radicals selected from the group consisting of —CH_3, —C_2H_5, —C_3H_7, —C_4H_9 or —H when the other R' or R" is an alkyl radical of 1–4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

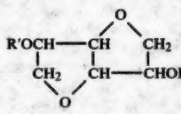
4,627,979

TOOTHPASTE DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE PLAQUE ACCUMULATION AND IRRITATION

Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649.
This application Dec. 27, 1985, Ser. No. 814,119
Int. Cl.[4] A61K 7/16, 9/68, 7/22
U.S. Cl. 424—54 8 Claims

1. A method for inhibiting the formation of plaque and calculus in the oral cavity of mammals which comprises periodically treating the surfaces of the teeth and gums with a toothpaste composition containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula



wherein R' and R" are individually selected from alkyl radicals selected from the group consisting of $-CH_3$, $-C_2H_5$, $-C_3H_7$, $-C_4H_9$ or —H when the other R' or R" is an alkyl radical of 1–4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

4,627,980

HARD CANDY DENTIFRICE FORMULATION AND METHOD OF TREATING TEETH, MOUTH AND THROAT THEREWITH TO REDUCE IRRITATION AND PLAQUE ACCUMULATION

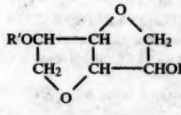
Matthew J. Lynch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 685,167, Dec. 21, 1984, Pat. No. 4,585,649. This application Dec. 27, 1985, Ser. No. 813,866

Int. Cl.[4] A61K *7/22, 7/16*

U.S. Cl. 424—54 **8 Claims**

1. A method for inhibiting the formation of plaque and calculus and relieving throat irritation in the oral cavity of mammals which comprises periodically treating the surfaces of the throat, mouth, teeth and gums by dissolving in the mouth a hard candy composition containing an *S. mutans* inhibiting amount of a dianhydrohexitol compound having the general formula:



wherein R' and R" are individually selected from alkyl radicals selected from the group consisting of $-CH_3$, $-C_2H_5$, $-C_4H_9$ or —H wherein R' or R" is an alkyl radical of 1–4 carbon atoms whereby at least a portion of the bacteria on said surfaces is essentially inhibited from further growth or removed by dissolution.

4,627,981

ATTRACTANT-INGESTION STIMULANT PREPARATIONS FOR *PERIPLANETA AMERICANA* L

Kimihide Shimano, Shiraoka; Haruo Shimamura, Yono; Hiroshi Yamaguchi, Tokyo; Hiroshi Murayama, Houya; Ryohei Kaneko, Kiryu, and Katsura Seki, Utsunomiya, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1985, Ser. No. 709,180

Claims priority, application Japan, Sep. 14, 1984, 59-192787; Sep. 18, 1984, 59-195469

Int. Cl.[4] A01N *25/00*

U.S. Cl. 424—84 **14 Claims**

1. A method of attracting *Periplaneta americana* L comprising applying a composition comprising an attractant-ingestion stimulant agent in a location wherein *Periplaneta americana* L are present in the environment, said attractant-ingestion stimulant agent comprising an amount of at least one compound selected from the group consisting of ar-α-tetralol, ar-β-tetralol, ac-α-tetralol, α-naphthol, β-naphthol and iristectorumin's alcohol effective to attract *Periplaneta americana* L whereby *Periplaneta americana* L are attracted to said composition.

4,627,982

PARTIALLY PURIFIED BONE-INDUCING FACTOR

Saeid Seyedin, Mountain View, and Thomas Thomas, Davis, both of Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 630,938, Jul. 16, 1984, abandoned. This application Feb. 26, 1985, Ser. No. 705,479 The portion of the term of this patent subsequent to Feb. 28, 2001, has been disclaimed.

Int. Cl.[4] A61K *35/32*

U.S. Cl. 424—95 **8 Claims**

1. A process for preparing a partially purified bone-inducing factor which comprises:

(a) treating demineralized bone with a chaotropic extractant that solubilizes nonfibrous proteins;

(b) subjecting the extract from step (a) to gel filtration to recover a fraction containing proteins of molecular weight 10,000–30,000;

(c) adsorbing the fraction from step (b) onto a carboxymethyl cellulose cation exchanger at approximately pH 4.5–5.5; and

(d) eluting an osteogenically active fraction from the cation exchanger with a sodium chloride gradient of about 10 mM to about 150 mM in the presence of a nonionic chaotropic agent.

4,627,983

FUNCTIONAL PROTEIN HYDROLYZATES, A PROCESS FOR THEIR PREPARATION, USE OF THESE PROTEIN HYDROLYZATES AS A FOOD ADDITIVE, AND FOODS CONTAINING THESE PROTEIN HYDROLYZATED

Udo Scharf, Frankfurt am Main; Merten Schlingmann, Königstein, and Gert-Wolfhard von Rymon Lipinski, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 438,753, Nov. 3, 1982, abandoned. This application Sep. 11, 1985, Ser. No. 775,101

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143947

Int. Cl.[4] A23J *3/00;* **A23L** *1/305;* **C12P** *21/06*

U.S. Cl. 426—7 **19 Claims**

1. A functional hydrolyzate obtained from enzymatically hydrolyzed microbial protein isolates, with properties comprising

a protein content of more than 90% by weight,

a nucleic acid content of less than 2% by weight,

a lipid content of less than 1% by weight,

a suspendability of 80–100%,

a foaming capacity characterized by a foaming index of 4–7,

a foam stability characterized by a half-life of 10–300 minutes,

an emulsifying capacity characterized by a value of 300–500 ml of oil/g of protein, and

a molecular weight of between 125,000 and 100 Daltons.

4,627,984

PROCESS FOR MANUFACTURING AND PACKAGING SOFT CHEESE

Marc Authelet, Laneuveville Dt Nancy, and Jean Perrin, Tomblaine, both of France, assignors to Saint-Hubert Industrie Laitiere, Ludres, France

Filed Dec. 20, 1984, Ser. No. 684,050

Claims priority, application France, Dec. 23, 1983, 83 20699

Int. Cl.[4] A23C *19/097*

U.S. Cl. 426—37 **12 Claims**

1. A process for extending the shelf life of soft cheese with a bloomed or washed rind to a period of at least three months comprising:

a. wrapping said cheese in a wrapper having a moisture-absorbing inside layer on the side of the wrapper in

contact with the cheese, and a moisture-proof outside layer;

b. placing the so wrapped cheese into a hermetically sealable box with at least the inside surface thereof being coated with a heat sealable, moisture-impervious coating, said box having an upper edge for receiving a moisture-impermeable lid;

c. sealing a moisture-impermeable lid onto said upper edge so as to effect a hermetical seal; and

d. pasteurizing the so wrapped and boxed cheese at a temperature between 100° C. and 130° C.

4,627,985

PROCESSED SOYBEAN FOODS AND THEIR PRODUCTION

Hideo Yada, Settsu; Kunihisa Akaba, Iida, and Megumi Mukaiyama, Shimoina, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan, by said Hideo Yada and Asahi-Matsu Foods Inc., Nagano, Japan, by said Kunihisa Akaba and Megumi Mukaiyama

Filed Apr. 23, 1984, Ser. No. 602,721

Claims priority, application Japan, Apr. 25, 1983, 58-73602

Int. Cl.[4] A23L *1/20*; A23J *3/00*

U.S. Cl. 426—92 **2 Claims**

1. A method of producing a fibrous or granular processed soybean food having improved flavor and palatability, which comprises coating the surfaces of fibrous or granular soybean preparation which is produced by adjusting the water content of whole grains of soybean to between 30 to 60% by weight and grinding said grains between two opposing disc grinding members separated by a gap not larger than 1 mm, wherein one of the grinding members rotates at a peripheral speed from 8 to 8000 r.p.m., and wherein the opposing discs are concave to form a central hollow portion therebetween having an approximately trapezoidal cross section with fish-paste in the form of aqueous slurry having a viscosity of 10 centipoises to 1×10^4 poises, the fibrous or granular soybean preparation having a water content of 20% by weight or less at the time of coating, and the fish-paste being coated in an amount of about 50 to 250 g per 1 kg of the fibrous or granular soybean preparation, on a dry basis thereby producing said soybean food having improved flavor and palatability.

4,627,986

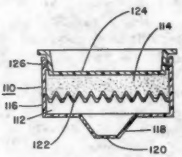
PRESSURIZED CONTAINER PROVIDING FOR THE SEPARATE STORAGE OF A PLURALITY OF MATERIALS

Robert F. Bardsley, Harrington Park, N.J.; Thomas P. Finucane, Martsdale, N.Y.; Carl Hebel, Dover Foxcroft, Me.; Charles D. Schoonmaker, Boonton Township, Morris County, N.J., and Philip J. Wruk, Wilton, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 336,838, Jan. 4, 1982, Pat. No. 4,399,158, which is a continuation of Ser. No. 917,262, Jun. 20, 1978, abandoned. This application Mar. 29, 1982, Ser. No. 363,295

Int. Cl.[4] B65D *25/08*

U.S. Cl. 426—112 **3 Claims**



1. A container arrangement for separately storing a first liquid material and a second material in a container and providing for the automatic admixing of the first and second materials upon opening of the container, comprising a sealed container containing said first liquid material at superatmospheric pressure, with the pressure surrounding said container being atmospheric, a separate closed compartment arranged within said container and containing said second material out of admixing contact with said first liquid material in said container, said compartment comprising a first pressure chamber and a separate material chamber containing said second material, said two chambers of said separate closed compartment being separated from each other by a flexible wall, a portion of the wall of the compartment which defines said pressure chamber having at least one small aperture therein and a portion of the wall of the compartment which defines the material chamber having a rupturable or separable portion, said at least one small aperture in said chamber wall being of such small size and the rupturable or separable portion being of such weakness, and the at least one small aperture, said flexible wall, and said rupturable or separable portion being of such orientation to each other, such that when the container is pressurized, said at least one small aperture allows the pressure chamber to gradually assume the pressure of the container but upon opening the container, the pressure in the container rapidly drops to atmospheric, however said at least one small aperture being too small to allow the pressure in the pressure chamber to adjust too rapidly to the lower pressure then present in the container and therefore the pressure chamber being momentarily at a much higher pressure than the surrounding container interior such that the higher pressure causes the flexible wall to expand pushing the second material against the rupturable or separable portion such that the portion ruptures or separates, such that the second material is released into the liquid material of the container.

4,627,987

EDIBLE MATERIAL CONTAINING META-HYDROXYBENZOIC OR SALTS

Ronald E. Barnett, Suffern, and Ronald G. Yarger, Pearl River, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 477,799, Mar. 22, 1983, abandoned, which is a continuation-in-part of Ser. No. 274,035, Jun. 15, 1981, abandoned. This application Dec. 20, 1984, Ser. No. 683,972

Int. Cl.[4] A23L *1/236*

U.S. Cl. 426—548 **16 Claims**

1. An edible composition comprising

an edible material,

a food-acceptable sweetener for sweetening said edible material, other than m-hydroxybenzoic acid or a food-acceptable, non-toxic salt thereof, said sweetener being present in an amount sufficient to sweeten said edible composition and above 1 wt. % sucrose equivalents, and

a sweetness-modifying agent selected from m-hydroxygenzoic acid, food-acceptable, non-toxic salts thereof, and mixtures thereof wherein the sweetness modifying agent is present in an amount from 0.01 to 0.4% by weight based on the consumed weight of said edible material, said edible composition having a pH of from 2 to 5.5.

4,627,988

METHOD FOR APPLYING MATERIAL TO A SEMICONDUCTOR WAFER

Keith G. Spanjer, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

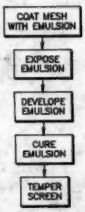
Filed Jul. 29, 1985, Ser. No. 759,792

Int. Cl.[4] H01L *21/312*

U.S. Cl. 427—5 **15 Claims**

1. A method of applying material containing a solvent damaging to a photosensitive emulsion to a semiconductor wafer comprising the steps of:

applying said photosensitive emulsion to a screen;
patterning said photosensitive emulsion;



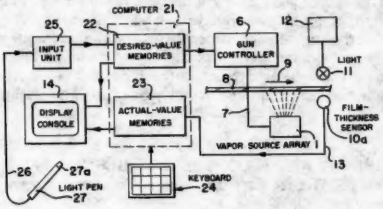
tempering said patterned photosensitive emulsion at an elevated temperature for a prolonged period; and
applying said material to said wafer through said screen.

4,627,989

METHOD AND SYSTEM FOR A VACUUM EVAPORATIVE DEPOSITION PROCESS

Albert Feuerstein, Neuberg; Gernot Thorn, Hanau am Main, and Horst Ranke, Filderstadt, all of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 639,363
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1983, 3330092
Int. Cl.[4] C23C *13/04, 13/08*
U.S. Cl. 427—10 **5 Claims**



1. A method for a vacuum evaporative deposition process in which the local evaporation power of a vapor source is adjustable to control the evaporation rate from the vapor source for controlling the thickness of a film deposited on a substrate by the vapor evaporated from the vapor source, comprising:
determining the local evaporation power of each vapor source and the thickness of the film deposited on the substrate by each vapor source;
displaying the determined local evaporation power and film thickness as spatially-coordinated bars of charts thereof on a single display screen, at least the film-thickness bar chart being at least relatively calibrated on the display screen; and
adjusting the local evaporation power of any vapor source to correct any deviation of any bar of the film-thickness bar chart from a film thickness desired relative to the calibration thereof.

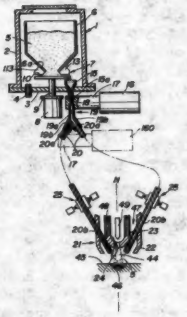
2. A system for a vacuum evaporative deposition process in which the local evaporation power of a vapor source is adjustable to control the evaporation rate from the vapor source for controlling the thickness of a film deposited on a substrate by the vapor evaporated from the vapor source, comprising:
means for determining the local evaporation power of each vapor source and the thickness of the film deposited on the substrate by each vapor source;
means for displaying the determined local evaporation power and film thickness as spatially-coordinated bars of charts thereof on a single display screen, at least the film-thickness bar chart being at least relatively calibrated on the display screen; and
means for adjusting the local evaporation power of any vapor source to correct any deviation of any bar of the film-thickness bar chart from a film thickness desired relative to the calibration thereof.

4,627,990

METHOD OF AND APPARATUS FOR SUPPLYING POWDERY MATERIAL

Toshihiko Saga; Tsuyoshi Makita; Hisao Hirono, and Akitaka Inao, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,916
Claims priority, application Japan, Mar. 7, 1984, 59-44250; Apr. 9, 1984, 59-70678; Apr. 9, 1984, 59-70679
Int. Cl.[4] B05D *1/00, 3/12*
U.S. Cl. 427—10 **16 Claims**



1. A method of supplying a powdery material to a workniece to be processed thereby, comprising the steps of:
(a) discharging the powdery material from storage means;
(b) feeding the powdery metal material discharged from said storage means into the tube means extending into the shield cap of a plasma torch nozzle in the vicinity of the workpiece; and
(c) ultrasonically vibrating said tube means for supplying the powdery material therethrough through said shield cap to said workpiece.

4,627,991

METHOD FOR FORMING A PROTECTIVE FILM ON A SEMICONDUCTOR BODY

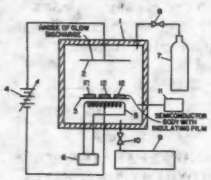
Yasukazu Seki, Tokyo; Noritada Sato, and Osamu Ishiwata, both of Kanagawa, all of Japan, assignors to Fuji Electric Corporate Research & Development Co., Ltd. and Fuji Electric Co., Ltd., both of Kanagawa, Japan

Filed May 16, 1984, Ser. No. 610,638
Claims priority, application Japan, May 26, 1983, 58-93221
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—39 **1 Claim**

1. A method for forming a protective film on a semiconductor body having a surface film of a compound of the semiconductor material, comprising:
placing a semiconductor body with a surface film of a compound of said semiconductor material in a vacuum chamber maintained at a high vacuum,

heating said semiconductor body to a temperature below about 400° C.,

introducing a diborane gas into said chamber, and



generating a glow discharge in said chamber to thereby deposit a protective boron film containing boron on the surface film of the semiconductor.

4,627,992

PROCESS FOR THE PRODUCTION OF FILTER ELEMENTS BASED ON AROMATIC POLYAMIDE

Charles T. Badenhop, Bad Kreuznach; Anna-Luise Bourguignon, Mittelreidenbach, and Joachim Fischer, Bad Kreuznach, all of Fed. Rep. of Germany, assignors to Seitz-Filter-Werke Theo & Geo Seitz GmbH & Co., Bad Kreuznach, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 673,654

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342823

Int. Cl.⁴ B05D *5/00*

U.S. Cl. 427—244 **14 Claims**

1. A process for the production of an aromatic-polyamide-based filter element in the form of a filter membrane, membrane/deep filter combination or filter body, said process comprising the steps of:

(a) preparing a solution of a filter-forming aromatic polyamide in an aprotic solvent;

(b) preparing a solvent mixture by adding to the said solvent of the aromatic polyamide a liquid pore former and a precipitating agent in such quantities that the said solvent mixture contains:

a pore former, said former being ethylene glycols of molecular weight ranging from 50 to 400, in a quantity of from 20 to 35% by weight,

a precipitating agent, said agent being water, in a quantity ranging from 1% by weight to the limit of the solution stability of the polyamide, and

remainder comprising aprotic solvent, the said solution of the aromatic polyamide being retained in a true stable solution status within the said solution mixture;

(c) forming a desired semi-finished filter element by pouring said solution mixture unto a smooth support strip and treating immediately after forming the said semi-finished fliter element in a precipitation and coagulation bath at a bath temperature of from 5° C. to 35° C. over a period from 3 to 10 minutes until complete precipitation of the aromatic polyamide, said precipitation and coagulation bath having apart from the aromatic polyamide the same components but at a substantially higher quantity of precipitation agent than said solution mixture, said precipitation and coagulation bath containing from 35 to 55% by weight of the same solvent as the solvent mixture and from 1% by weight to 40% by weight of the same pore former as the solution mixture, the remainder being precipitating agent, so that the bath has

(c1) a pore former content of from 1% by weight to the same percentage pore former content as the solution mixture for forming filter elements having an asymmetric cell structure and a pore size in an active separating layer formed from said aromatic polyamide of from 0.05 μm to 10 μm for separating particles by microfilitration or

(c2) a pore former content in the range extending from the same percentage pore former content as the solution mixture to 40% by weight, for forming filter elements having a symmetric cell structure and a pore size of 0.05 μm to 10 μm for the separation of particles by microfiltration, whereas

(d) after coagulation of the aromatic polyamide, the filter element is washed in water unit complete removal of the solvent and pore former and precipitation agent used.

4,627,993

THERMOPLASTIC ELASTOMERIC COMPOSITIONS BASED ON COMPATIBLE BLENDS OF AN ETHYLENE COPOLYMER AND VINYL OR VINYLIDENE HALIDE POLYMER

Gary L. Loomis, Drexel Hill, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 572,078, Jan. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 427,413, Sep. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 394,329, Jul. 1, 1982, abandoned. This application May 9, 1985, Ser. No. 732,089

Int. Cl.⁴ C08L *181/00, 77/00;* **C08F** *265/04;* **C08K** *3/00*

U.S. Cl. 428—36 **18 Claims**

1. A partially crosslinked, thermoplastic, melt-processible, elastomeric blend of

(a) a copolymer of ethylene and one or more ethylenically unsaturated organic monomers selected from the class consisting of esters of unsaturated C_3–C_{20} mono- or dicarboxylic acids, vinyl esters of saturated C_2–C_{18} carboxylic acids, vinyl alkyl ethers wherein the alkyl group has 1–18 carbon atoms, vinyl or vinylidene halides, acrylonitrile, methacrylonitrile, norbornene, alpha-olefins of 3–12 carbon atoms, and vinyl aromatic compounds; and

(b) between 5 and 75 weight percent, based on the composition, of a vinyl or vinylidene halide polymer

wherein the comonomer content in (a) is such that the ethylene copolymer is compatible with the vinyl or vinylidene halide polymer; there being present in the blend no polymerizable polyunsaturated compound or polymer of such compound.

4,627,994

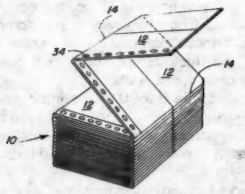
LABEL BEARING CONTINUOUS BUSINESS FORM

Bernhard J. Welsch, Cary, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed Jan. 16, 1986, Ser. No. 819,380

Int. Cl.⁴ B32B *3/06*

U.S. Cl. 428—41 **9 Claims**



1. A continuous business form comprising:

an elongated ply of label stock of a desired width and having one side coated with a pressure sensitive adhesive;

an elongated ply of release liner stock of about said desired width and having a release side engaged with said adhesive on said one side;

said release liner and said label stock plies being laterally offset from one another so that a narrow longitudinal strip of adhesive unengaged with said release liner exists; and

an elongated ply of record or message bearing stock adhered at one edge to said label stock at said narrow longitudinal strip of adhesive.

4,627,995

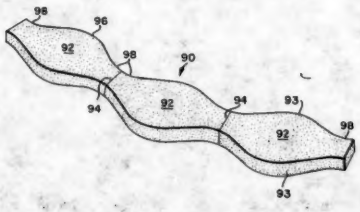
FIBERGLASS INSULATION WRAP FOR INSULATING A PIPE ELBOW

Chris J. Botsolas, St. Petersburg, Fla., assignor to Carol Botsolas, St. Petersburg, Fla.

Continuation of Ser. No. 535,911, Sep. 26, 1983, Pat. No. 4,553,308. This application Jun. 14, 1985, Ser. No. 745,418

Int. Cl.[4] F16l 9/22

U.S. Cl. 428—43 8 Claims



1. Fiberglass insulation for use in insulating a pipe elbow, said insulation comprising a continuous strand of a plurality of removably connected fiberglass wraps, each of said wraps comprising a pair of opposed ends having essentially the same width and a mid-section connecting the opposed ends having opposed arcuate sides wherein the width of the mid-section measured at any point along the opposed arcuate sides is greater than the width of the opposed ends.

4,627,996

SODIUM-SULFUR STORAGE BATTERY AND A MANUFACTURING METHOD OF THE SAME

Hiroshi Kagawa, Takatsuki, Japan, assignor to Yuasa Battery Co., Ltd., Osaka, Japan

Filed Oct. 30, 1985, Ser. No. 792,742

Claims priority, application Japan, Dec. 7, 1984, 59-259594

Int. Cl.[4] H01M 10/00; B32B 3/06

U.S. Cl. 428—104 7 Claims

1. A sodium-sulfur storage battery comprising a solid electrolyte tube; and alpha alumina ring jointed with solder glass to the solid electrolyte tube; a negative cover thermocompressively jointed to the upper surface of said alpha alumina ring and a positive cover thermocompressively jointed to the lower surface of said alpha alumina ring, there being, diffusion layers of chrome provided on the surfaces of the negative and positive covers, and coating layers of aluminum provided at least on the surfaces, which are thermocompressively jointed, of the negative and positive covers.

4. A manufacturing method of a sodium-sulfur storage battery wherein a negative cover is thermo-compressively jointed to an upper surface of an alpha alumina ring which are jointed with solder glass to a solid electrolyte tube, and a positive cover is thermocompressively jointed to a lower surface of said alpha alumina ring, there being diffusion layers of chrome provided on the surfaces of the negative and positive covers, coating layers of aluminum provided at least on the surfaces, which are thermocompressively jointed, of the negative and positive covers, and thermocompressively jointing surfaces thermocompressively jointed in the air with aluminum rings thereon, respectively.

4,627,997

THERMAL TRANSFER RECORDING MEDIUM

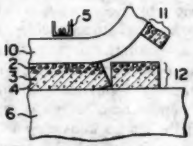
Youji Ide, Mishima, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 747,160

Claims priority, application Japan, Jun. 22, 1984, 59-128841; Aug. 29, 1984, 59-179862; Mar. 15, 1985, 60-52823; Mar. 19, 1985, 60-55121; Apr. 2, 1985, 60-70508

Int. Cl.[4] B41M 3/12

U.S. Cl. 428—216 16 Claims



1. In a thermal transfer recording medium which comprises a heat-resistant substrate and a thermally meltable inking layer consisting essentially of a coloring agent, waxes and a binder on said substrate, the improvement which comprises; a fluorescent substance consisting of a wax-like substance solid solution or a resin solid solution of a fluorescent dye, said solid solution having a melting or softening point of 50°–140° C., is further contained in said inking layer.

4,627,998

CARBON FIBER REINFORCED CONCRETE

Shigeyuki Akihama, Kanagawa; Tatsuo Suenaga, Tokyo; Makoto Saito, Kanagawa; Hideki Ikeda; Masanori Aya, both of Tokyo; Seiichi Koyama, Ibaraki; Masashi Kamakura, Hyogo; Naoto Mikami, Hyogo, and Hideaki Miyuki, Hyogo, all of Japan, assignors to Kajima Corporation, Tokyo, Japan

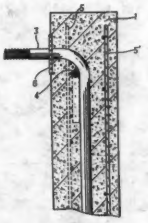
PCT No. PCT/JP85/00103, § 371 Date Oct. 16, 1985, § 102(e) Date Oct. 16, 1985, PCT Pub. No. WO85/03930, PCT Pub. Date Sep. 12, 1985

PCT Filed Mar. 1, 1985, Ser. No. 795,697

Claims priority, application Japan, Mar. 2, 1984, 59-38866; Mar. 2, 1984, 59-38867

Int. Cl.[4] B32B 15/00

U.S. Cl. 428—285 7 Claims



5. A precast composite structure of carbon fiber reinforced concrete comprising a matrix of cured carbon fiber reinforced concrete containing 0.2 to 10% by volume of carbon fiber, at least one ferrous metallic member at least partly buried in said matrix and an insulating layer on the surface of said ferrous metallic member for preventing contact of said ferrous metallic member with the carbon fiber, said insulating layer having an electric resistance of at least about 100 ohms.

4,627,999

PROCESS FOR PREFINISHED EXTERIOR HARDBOARD

Tracy C. Hsu, Avon Lake, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Mar. 20, 1985, Ser. No. 713,767
Int. Cl.[4] B32B *22/00*; B05D *3/02*
U.S. Cl. 428—326 9 Claims

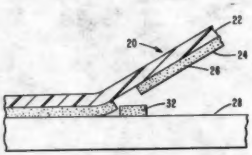
1. In a process for the manufacturing of a prefinished hardboard to withstand moisture and weathering which comprises:
(a) forming the board in a press from lignocellulosic fibers under heat and pressure,
(b) releasing the hardboard from the press,
(c) applying one or more coatings in the nature of primer and top finish coatings,
(d) curing the coated board after each coating application;
the improvement which comprises treating said hardboard between steps (b) and (c) with a vinylidene chloride copolymer prepaint sealer and curing or drying said sealed board before application of the primer or finish coat which comprises:
(a) 50–90 weight percent vinylidene chloride;
(b) 10–50 weight percent other copolymerizable monomers selected from the group consisting of acrylic and methacrylic acid and their C_{1-20} alkyl or unsaturated alkyl esters, styrene, acrylonitrile, and hydroxyalkyl or aminoalkyl acrylate or methacrylate; and
wherein said sealer is optionally formulated with 0.01 to 1.25 parts per hundred parts resin of a surfactant selected from the group consisting of nonionic, anionic, cationic and amphoteric fluorosurfactants and non-fluorinated surfactants and mixtures thereof.

4,628,000

THERMAL TRANSFER FORMULATION AND MEDIUM

Shashi G. Talvalkar, Kettering, and Thomas P. Besselman, Centerville, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 28, 1984, Ser. No. 687,221
Int. Cl.[4] B41M *5/26*
U.S. Cl. 428—341 22 Claims



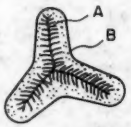
14. A ribbon for use in non-impact printing comprising a substrate and a transfer layer which is a mixture containing about 3 to 80% sucrose benzoate transfer agent, about 3 to 30% drying oil, about 1 to 10% dye, about 1 to 3% lecithin, about 5 to 20% coloring pigment, about 2 to 40% wax, all by dry weight, and about 40 to 60% solvent by wet weight for solubilizing the mixture.

4,628,001

PITCH-BASED CARBON OR GRAPHITE FIBER AND PROCESS FOR PREPARATION THEREOF

Hideharu Sasaki; Toru Sawaki, and Yoshiaki Yoshioka, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 3, 1985, Ser. No. 719,585
Claims priority, application Japan, Jun. 20, 1984, 59-125047; Jun. 20, 1984, 59-125048; Aug. 15, 1984, 59-169199
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—367 9 Claims



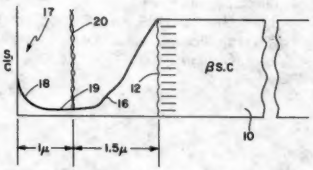
1. A pitch-based carbon or graphite fiber having a leafy lamella arrangement in at least 30% of the fiber cross-sectional area and having a tensile strength of at least 300 kg/mm^2.

4,628,002

SILICON CARBIDE MONOFILAMENT FOR TRANSVERSE COMPOSITE PROPERTIES

Raymond J. Suplinskas, Haverhill; Thomas W. Henze, Lawrence, both of Mass., and James V. Marzik, Nashua, N.H., assignors to Avco Corporation, Lowell, Mass.

Filed May 28, 1985, Ser. No. 738,614
Int. Cl.[4] D02G *3/00*; B32B *9/00*
U.S. Cl. 428—367 10 Claims



1. An SiC monofilament for use in combination with a matrix material to form a composite material comprising:
an SiC monofilament having a bulk SiC layer;
a layer of fine grain SiC having a finer grain size than the grain size of the bulk SiC deposited on the bulk SiC; and
a surface transition zone deposited on the fine grain SiC layer for interacting with the matrix.

4,628,003

HIGH TEMPERATURE HEAT SEAL FILM

Morton Katz, 2245 Lane Rd., Columbus, Ohio 43220

Continuation of Ser. No. 439,187, Nov. 4, 1982, abandoned, which is a continuation-in-part of Ser. No. 290,870, Aug. 7, 1981, abandoned. This application Mar. 20, 1985, Ser. No. 713,947
Int. Cl.[4] B32B *15/08, 27/30*
U.S. Cl. 428—377 7 Claims

1. A laminar structure for use in wrapping around cable or wire to provide continuous, heat sealed, electrical insulation comprising an inner layer of a polyimide and two outer layers of a pigmented fluoropolymer, wherein the outer layers have a thickness from 1 to 200 microns and consist essentially of a heat sealing fluoropolymer exhibiting a melting point of not more than about 300° C. and including from 1 to 10 percent, by weight, of heat absorbing carbon pigment with substantially the same amount of pigment dispersed in each of the outer layers.

5. A wire or cable spirally wrapped by a strip of the laminar structure of claim 1 wherein edges of the strip of the laminar structure overlap and the strip has been heat sealed to itself at the overlapped edges.

4,628,004

POWDER METAL AND/OR REFRACTORY COATED FERROUS METAL

Richard A. Nickola, Munster, and Brian A. Sok, Cedar Lake, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Continuation-in-part of Ser. No. 511,570, Jul. 7, 1983, Pat. No. 4,542,048. This application Mar. 25, 1985, Ser. No. 715,892

Int. Cl.[4] B32B *27/38;* B05D *3/02*

U.S. Cl. 428—413 **25 Claims**

1. A method of providing a ferrous metal strip with a ductile adherent protective coating having improved deep drawing properties comprising;

(a) applying to a clean surface of the ferrous metal strip a uniform fluid coating of a finely divided protective coating material selected from the group consisting of powdered protective metal and nonmetallic refractory material uniformly dispersed in a solution of a synthetic resin binder solubilized with an organic solvent which is volatilized at a temperature between about 30° C. (86° F.) and about 274° C. (525° F.);

(b) said resin binder being adherent to said surface of the metal strip and having a Tukon hardness range of between 10 and 15 and a glass transition temperature which is between about 35° C. and 180° C. (95° F. and 356° F.) and said resin binder comprising between about 10 volume percent and 50 volume percent of said coating on a solvent free basis with the balance being powdered protective coating material;

(c) heating the fluid coated metallic strip to remove said volatile solvent and set the resin binder to provide a dry cured resin-powder protective coating on the surface of said ferrous metal strip which is formable at room temperature and exhibits deep drawing properties;

(d) and said resin-powder coated ferrous metal strip characterized by forming an adherent formable resin free protective coating on said strip when said strip is heated to a sintering and diffusion temperature.

4,628,005

HEAT WAVE SHIELDING LAMINATION

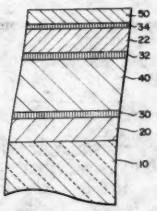
Tadayoshi Ito, and Taga Yasunori, both of Aichi, Japan, assignors to Kabushiki Kaisha Toyoto Chuo Kenkyusho, Aichi, Japan

Filed Dec. 6, 1984, Ser. No. 678,704

Claims priority, application Japan, Dec. 9, 1983, 58-233224

Int. Cl.[4] G02B *1/10*

U.S. Cl. 428—432 **4 Claims**



1. A heat wave shielding lamination having improved abrasion resistance, without effecting its optical characteristics, comprising: a visible light transparent substrate; and an overlying composite lamination consisting of at least two layers of visible light transparent substance of a low refractive index and at least two layers of visible light transparent substance of a high refractive index lying alternately on each other, with the topmost layer being said low-refractive layer, and at least one interfacial layer of Al_2O_3 provided between said high-refractance and low-refractance layers, said interfacial layer being much thinner than said high-refractance and low-refractance layers with the thickness of the interfacial layer being in the range of 5–20 nm said high-refractance layers being formed of a material selected from TiO_2, CeO_2, ZnS, CdS and ZrO_2, each of which being thick enough to reflect infrared rays, and said low-refractance layers being formed of a material selected from SiO_2, MgF_2, LiF, CeF_3 and CaF_2, the top most layer thereof being of a thickness which prevents reflection of visible light and other layers thereof being thick enough to reflect infrared rays.

4,628,006

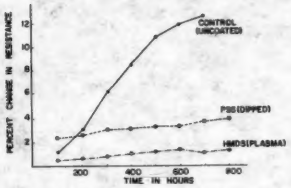
PASSIVATION OF HYBRID MICROELECTRONIC CIRCUITS

Bonnie L. Rathbun, Ithaca, and Philipp W. H. Schuessler, Endwell, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 20, 1984, Ser. No. 572,340

Int. Cl.[4] B32B *9/04;* B05D *5/12, 1/00*

U.S. Cl. 428—446 **2 Claims**



1. A process for passivating a microelectronic device comprising the steps of:

drawing a vacuum of 10 to 20 microns on a reaction chamber;

introducing hexamethyldisilazane (HMDS) monomer into said reaction chamber;

subjecting the monomer to electromagnetic energy at a frequency of 13.56 Mhz to form a plasma thereof within the chamber;

exposing the device to said plasma for depositing a polymerized thin film layer of the HMDS on the device; and

continuing said deposition until the layer of a desired thickness has been deposited on the device.

4,628,007

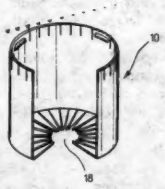
TRASH BAG INSERT

Paul Ledsham, 361 Sandford Street, Newmarket, Ontario, Canada L3Y 4S2

Filed Jan. 10, 1984, Ser. No. 569,725

Int. Cl.[4] B65D *5/56*

U.S. Cl. 428—542.8 **6 Claims**



1. An insert for holding open and supporting in a general upright position a trash bag not capable of self-support,

said insert comprising a generally rectangular member which is rollable under pressure upon itself for fitting within the trash bag and having resiliency characteristics and a thickness to resist such rolling with opposing outer edges of said insert being free to allow rolling and unrolling of said insert such that upon releasing the pressure, said member springs open and automatically unrolls in a generally circular configuration until restrained by the bag, thereby holding the bag open and supported in a generally upright position,

said insert having a plurality of bottom edge serrations providing generally triangular bottom portions foldable inwardly to form a bottom end of said insert, said bottom portions being free of one another such that said bottom end is adjustable with unrolling of said insert to the size of the bag.

4,628,008

METHOD FOR ELIMINATING, OR MINIMIZING THE EFFECTS OF, DEFECTS IN MATERIALS

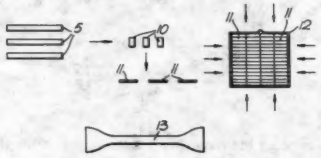
Ralph I. Conolly, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Nov. 10, 1983, Ser. No. 550,558

Claims priority, application United Kingdom, Nov. 16, 1982, 8232721

Int. Cl.⁴ B21K *3/00*; B23P *15/04*

U.S. Cl. 448—548 **12 Claims**



1. A method for manufacturing an article from a defect-immunized material comprising the steps of:

subjecting at least one initial body of material to a working process imparting a high degree of plastic deformation to the body to produce an upset ratio of at least 5:1 along at least one principal axis of the body;

cutting the deformed at least one body into a plurality of smaller pieces;

deforming each said smaller piece along an axis thereof different from said principal axis, thereby to put further work into the material;

stacking at least some of the deformed smaller pieces in a sealable container;

evacuating the container; and

bonding the pieces in the container together using a hot isostatic pressing technique to form the article.

4,628,009

MAGNETIC RECORDING MEDIUM

Masaharu Nishimatsu; Toshiaki Ide; Yoshiaki Saito, and Yuichi Kubota, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

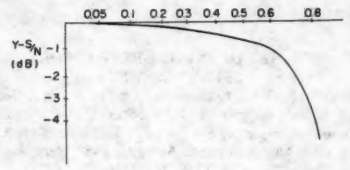
Continuation of Ser. No. 627,608, Jul. 3, 1984, abandoned. This application Nov. 12, 1985, Ser. No. 796,526

Claims priority, application Japan, Jul. 26, 1983, 58-135127

Int. Cl.⁴ G11B *5/72*

U.S. Cl. 428—694 **4 Claims**

1. A magnetic recording medium which comprises a plastic base film, a continuous thin film magnetic metal layer formed on one side of the base film and a thermoset backing layer formed on the other side of the base film, wherein the backing layer is made of thermosetting composition consisting essentially of a vinyl chloride-vinyl acetate-vinyl alcohol copolymer, a polyurethane prepolymer and a polyisocyanate and has a surface roughness of from 0.05 to 0.6 μm, whereby curling of



the medium induced by the presence of the thin magnetic metal layer is avoided.

4,628,010

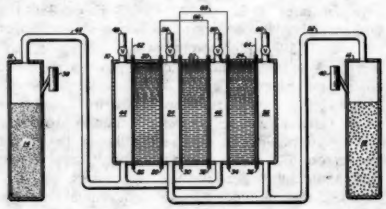
FUEL CELL WITH STORABLE GAS GENERATOR

Bernard L. Iwanciow, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 13, 1985, Ser. No. 808,776

Int. Cl.⁴ H01M *8/06*

U.S. Cl. 429—19 **1 Claim**



1. A system for providing gaseous hydrogen and oxygen to a hydrogen/oxygen fuel cell, the combination which comprises:

(a) a hydrogen/oxygen fuel cell assembly;

(b) a hydrogen gas generator having a first heterogeneous mixture comprising lithium borohydride and iron oxide contained therein;

(c) a means to initiate said first mixture to generate gaseous hydrogen;

(d) a means to feed said gaseous hydrogen to said hydrogen-/oxygen fuel cell;

(e) an oxygen gas generator having a second heterogeneous mixture comprising sodium chlorate and elemental iron contained therein;

(f) a means to initiate said second mixture to generate gaseous oxygen; and

(g) a means to feed said gaseous oxygen to said hydrogen-/oxygen fuel cell.

4,628,011

REJUVENATION OF NICKEL-CADMIUM AIRCRAFT BATTERY ELECTROLYTE

Kieva Feldman, Ottawa; Robert J. Charest, Nepean; Gaston Verville, Ottawa, and Joseph L. Lackner, Kanata, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, England

Filed Jan. 19, 1983, Ser. No. 459,141

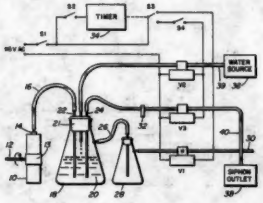
Claims priority, application Canada, Feb. 16, 1982, 396358

Int. Cl.⁴ H01M *10/42*

U.S. Cl. 429—49 **4 Claims**

1. A process for the regeneration of contaminated electrolyte outside an electrolytic cell, comprising:

(a) providing an electrolytic cell containing a volume of contaminated electrolyte;
(b) providing an external reservoir for containing a larger volume of clean electrolyte of suitable battery concentration and connecting said reservoir to said cell;
(c) applying a vacuum to said external reservoir to withdraw a quantity of the contaminated electrolyte from said cell into said external reservoir;



(d) mixing the contaminated electrolyte with said larger volume of clean electrolyte of suitable battery concentration in said external reservoir;
(e) releasing the vacumm in said external reservoir to return the mixed electrolyte to said cell; and
(f) repeating steps (c) to (e) until the concentration of contaminant in the cell electrolyte and the reservoir electrolyte are substantially equal.

4,628,012

EXPLOSION-PROOF, HERMETICALLY SEALED GALVANIC CELL

Dieter Spahrbier, Kelkheim-Fischbach, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Nov. 20, 1985, Ser. No. 799,945
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443453
Int. Cl.[4] H01M *2/12*
U.S. Cl. 429—53 **12 Claims**

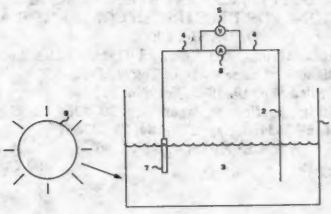
1. A galvanic cell with a tightly sealed metal housing which is protected from the risk of explosion and which comprises:
a first cylinder which is closed at one end; and
a second cylinder which is closed at one end;
wherein the cylinders are adapted for press-fit engagement with one another with the first cylinder being overlapped by the second cylinder;
an electrical insulation material disposed between the first and second cylinders in such a way that the cylinders can be pushed off from each other only in response to a predetermined internal pressure; and
at least one vent hole in the wall of the first cylinder in the region wherein the second cylinder overlaps the first cylinder.

4,628,013

PHOTOELECTROCHEMICAL CELL

Joseph E. Figard; David C. Rohlfing, both of Bartlesville, Okla., and Ralph S. Becker, Houston, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 2, 1983, Ser. No. 490,595
Int. Cl.[4] H01M *6/36*
U.S. Cl. 429—111 **15 Claims**



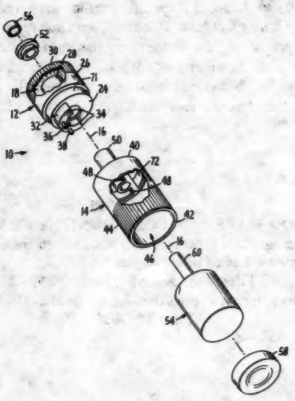
1. A photoelectrochemical cell comprising a semiconductive intrinsic amorphous silicon hydride cathode.

4,628,014

DEFERRED-ACTION BATTERY

Wayne R. Hruden, San Luis Obispo, Calif., assignor to Ultimate Survivor of America Inc., San Luis Obispo, Calif.

Filed Jan. 28, 1986, Ser. No. 823,399
Int. Cl.[4] H01M *6/30*
U.S. Cl. 429—113 **20 Claims**



1. A deferred-action battery comprising:
a rotor means having a longitudinal axis therethrough, said rotor means including a first chamber capable of holding an electrolytic solution, said first chamber having at least one off-axis portion thereof that protrudes axially away from the remainder of said first chamber; and
a stator means rotatably mounted about said axis, said stator means having a second chamber which is capable of holding a carbon rod, cathode mix, separator, a bottom insulator and an anode, said stator means axially adjacent to said rotor means, said rotor means and said stator means being rotatable with respect to each other, said axis portion axially extending into said second chamber, said stator means including rupturing means extending radially from said axis and rotatable to contact said off-axis portion of said first chamber, said rupturing means capable of destroying the integrity of said off-axis portion upon rotation

of said rotor means with respect to said stator means to allow communication between said first and second chambers and activation of the battery.

4,628,015

INSOLUBLE AND INFUSIBLE SUBSTRATE WITH A POLYACENE-TYPE SKELETAL STRUCTURE, AND ITS APPLICATIONS FOR ELECTRICAL CONDUCTOR AND ORGANIC CELL

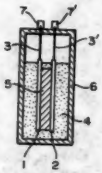
Shizukuni Yata, Hyogo, and Yukinori Hato, Osaka, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,889

Claims priority, application Japan, Sep. 20, 1984, 59-197838; Sep. 27, 1984, 59-203450; Sep. 27, 1984, 59-203451

Int. Cl.[4] H01M *4/60, 10/40*

U.S. Cl. 429—194 37 Claims



1. An insoluble and infusible substrate with a polyacene-type skeletal structure having a hydrogen/carbon atomic ratio of from 0.05 to 0.60 and a specific surface area, measured by the BET method, of at least 600 $m^2/9$, said substrate being a heat-treated product of a mixture comprising an aromatic condensation polymer consisting of carbon, hydrogen and oxygen as a matrix and a fiber component selected from the group consisting of phenol resin fibers and carbon fibers dispersed in said matrix.

4,628,016

MIRROR WAFER OF COMPOUND SEMICONDUCTOR

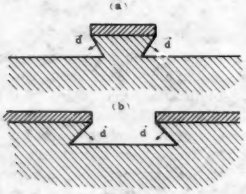
Jun Yamaguchi, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 30, 1985, Ser. No. 696,578

Claims priority, application Japan, Feb. 2, 1984, 59-13672[U]

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—30 8 Claims



1. A mirror wafer comprising a compound semiconductor wafer having a front surface and a rear surface wherein anisotropic patterns are naturally formed on said rear surface by an etching process, and wherein said wafer has a structure permitting easy determination of the mesa direction.

6. A mirror wafer of compound semiconductor having anisotropic patterns artificially formed on the rear surface by a photoetching process for denoting the mesa direction.

4,628,017

ELECTROSTATIC IMAGE FORMING METHOD

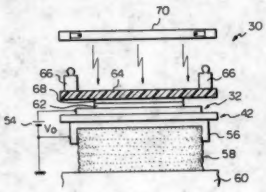
Izumi Tagoku, Tokyo, Japan, assignor to Ricoh Company, Limited, Tokyo, Japan

Filed Nov. 1, 1985, Ser. No. 793,914

Claims priority, application Japan, Nov. 2, 1984, 59-232003; Nov. 2, 1984, 59-232002; Nov. 2, 1984, 59-232001; Nov. 2, 1984, 59-232004; Nov. 2, 1984, 59-232005

Int. Cl.[4] G03G *13/044*

U.S. Cl. 430—48 7 Claims



1. An electrostatic image forming method for an image forming apparatus, said apparatus being provided with a photoconductive element having an electrode layer and a photoconductive layer, and a recording medium having at least a dielectric layer, at least one of the photoconductive element and the recording medium having transmissivity, said method comprising the steps of:

(a) causing the photoconductive layer of the photoconductive element and the dielectric layer of the recording medium to face and make close contact with each other with the intermediary of an air gap;

(b) applying a DC voltage across the electrode layer of the photoconductive element and the dielectric layer of the recording medium;

(c) projecting a light image for exposure from a back of one of the photoconductive element and the recording medium which has transmissivity; and

(d) controlling a light quantity of the light image;

whereby a positive electrostatic image or a negative electrostatic image is formed on the dielectric layer of the recording medium.

4,628,018

SILYLATED COMPOSITIONS, AND DEUTERATED HYDROXYL SQUARAINE COMPOSITIONS AND PROCESSES

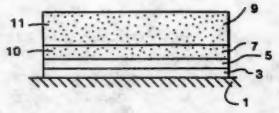
John W. Lin, and Lesley P. Dudek, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 613,137, May 23, 1984, Pat. No. 4,585,884.

This application Aug. 16, 1985, Ser. No. 766,326

Int. Cl.[4] G03G *5/06, 5/14*

U.S. Cl. 430—59 23 Claims



1. A photoresponsive device comprised of a conductive supporting substrate, a photoconductive layer comprised of the hydroxyl squaraines, and a top hole transporting layer comprised of a transporting molecule dispersed in a resinous binder, wherein the squaraines are prepared by affecting functionalization of a hydroxyl squaraine in an organic solvent system wherein the hydroxyl groups are silylated, and thereafter subjecting the resulting silylated products to hydrolysis enabling conversion to purified squaraine compositions.

6. A photoresponsive device in accordance with claim 1 wherein the charge transporting molecule is N,N'-diphenyl-N,N'-bis-3-methylphenyl-1,1'-biphenyl-4,4'-diamine.

4,628,019

PROCESS FOR DEVELOPING ELECTROSTATIC IMAGES AND TONER THEREFOR

Koshi Suematsu, Kawasaki; Takeshi Ikeda, Yokohama; Atsuko Yamamoto, Komae; Koji Goto, Kawasakishi, and Eiichi Imai, Narashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,546

Claims priority, application Japan, Apr. 27, 1984, 59-85318

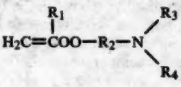
Int. Cl.[4] G03G 9/08

U.S. Cl. 430—106.6 16 Claims

1. A process for developing an electrostatic image, comprising:

defining a developing zone by disposing an electrostatic image bearing member having an electrostatic image on a surface thereof and a toner carrying member in an opposed relationship with a clearance therebetween;

providing a layer of a substantially non-magnetic toner on a surface of said toner carrying member, said toner layer having a thickness less than the distance defined by said clearance at the developing zone, wherein said toner comprises a colorant and a binder resin comprising a nitrogen-containing copolymer having a ratio (Mw/Mn) of weight average molecular weight (Mw) to number average molecular weight (Mn) which is less than 3.5, said nitrogen-containing copolymer being a copolymer of a vinyl monomer and an aminoacrylic monomer of the formula:



wherein R_1 is hydrogen, methyl or ethyl, R_2 is an alkylene having 1 to 4 carbon atoms, R_3 is an alkyl having 1 to 6 carbon atoms or phenyl and R_4 is an alkyl having 1 to 6 carbon atoms or phenyl; and

electrically transferring said toner to said electrostatic image bearing member by causing said toner to jump onto said electrostatic image bearing member, thereby developing said electrostatic image.

4,628,020

LIGHT-SENSITIVE COMPOUND MIXTURE AND COPYING MATERIAL COMPRISING O-NAPHTHQUINONEDIAZIDE COMPOUND

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

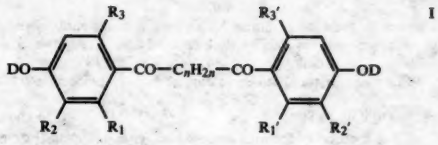
Filed Jan. 11, 1982, Ser. No. 338,640

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1981, 3100856

Int. Cl.[4] G03C 1/54, 1/94; C07C 113/00

U.S. Cl. 430—165 10 Claims

1. A light-sensitive copying material comprising a support and a light-sensitive layer containing a 1,2-naphthoquinone-2-diazide-sulfonic acid ester of a polyhydric phenol containing keto groups corresponding to the formula:



I

wherein

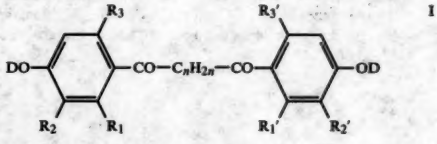
D represents a 1,2-naphthoquinone-2-diazide-5-sulfonyl or a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical,

R_1, R_2, R_3, R_1', R_2' and R_3' each represent hydrogen, halogen, alkyl groups having a 1 to 4 carbon atoms or radicals of the formula DO,

n represents an integer from 2 to 18,

and not more than three DO radicals are present on one benzene ring.

4. A light sensitive mxiture comprising a light-sensitive 1,2-naphthoquinone-2-diazide-sulfonic acid ester of a polyhydric phenol containing keto groups corresponding to the general formula:



I

wherein

D represent a 1,2-naphthoquinone-2-diazide-5-sulfonyl or a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical,

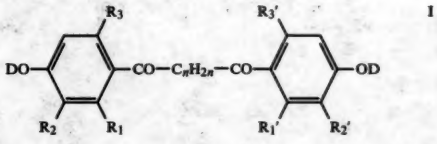
R_1, R_2, R_3, R_1', R_2', and R_3' each represent hydrogen, halogen, or alkyl groups having 1 to 4 carbon atoms or radicals of the formula DO,

n represents an integer from 2 to 18,

and not more than three DO radicals are present on one benzene ring, and

a water-insoluble binder which is soluble or swellable in aqueous-alkaline solutions.

7. A light-sensitive compound comprising a light-sensitive 1,2-naphthoquinone-2-diazide-sulfonic acid ester of a polyhydric phenol containing keto groups corresponding to the general formula:



I

wherein

D represents a 1,2-naphthoquinone-2-diazide-5-sulfonyl or a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical,

R_1, R_2, R_3, R_1', R_2' and R_3' each represent hydrogen, halogen, alkyl groups having 1 to 4 carbon atoms or radicals of the formula DO,

n represents an integer from 2 to 18,

and not more than three DO radicals are present on one benzene ring.

4,628,021

HEAT DEVELOPABLE COLOR PHOTOGRAPHIC MATERIALS WITH SILVER HALIDE CONTAINING IODIDE

Satoru Sawada, and Shingo Nishiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 2, 1984, Ser. No. 595,757
Claims priority, application Japan, Apr. 1, 1983, 58-56878
Int. Cl.[4] G03C 1/40, 5/54, 1/02
U.S. Cl. 430—203 29 Claims

22. A method of forming a color image, comprising the steps of:

imagewise exposing a heat developable color photographic material, comprising:

a support having thereon;

a light-sensitive crystal silver haloiodide which does not show a pattern of pure silver iodide in an X-ray diffraction pattern having a silver iodide content of 4 to 40 mole% and which is prepared by simultaneously reacting sources of Ag, I and at least one other halogen while maintaining a constant pAg;

a hydrophilic binder; and

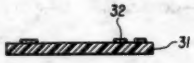
a dye-providing substance capable of providing a mobile dye, when the silver haloiodide is reduced to silver upon heating, in chemical relation to the reaction, which has the general formula C-L-D, wherein D is an image-forming dye moiety, L is a bonding group in which the C-L bonding is cleaved at the reaction of an oxidation product of the reducing agent and C is a moiety bonding Po an oxidation product of a reducing agent and has a ballast group.

4,628,022

MULTILAYER CIRCUIT BOARD FABRICATION PROCESS AND POLYMER INSULATOR USED THEREIN

Jose A. Ors, Solebury Township, Bucks County, Pa., and Richard D. Small, Jr., West Windsor Township, Mercer County, N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 513,485, Jul. 13, 1983, Pat. No. 4,511,757. This application Mar. 4, 1985, Ser. No. 707,596
Int. Cl.[4] G03C 1/68; C08F 8/00
U.S. Cl. 430—280 3 Claims



1. An energy sensitive material capable of curing under the influence of radiation comprises a non-rubber modified first epoxy resin wherein the terminal groups have been at least partially acrylated, a rubber modified second epoxy resin having a rubber in the backbone of the resin derived from reacting an epoxy resin with a carboxy terminated butadiene-acrylonitrile containing rubber and the terminal groups of which have been at least partially acrylated, said second epoxy resin being compatible with the first epoxy resin.

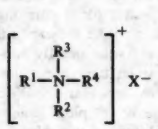
4,628,023

METAL ION FREE PHOTORESIST DEVELOPER COMPOSITION WITH LOWER ALKYL QUATERNARY AMMONIUM HYDROZIDE AS ALKALAI AGENT AND A QUATERNARY AMMONIUM COMPOUND AS SURFACTANT

John F. Cawston, Winchester, and Paul E. Becker, Norwood, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

Continuation of Ser. No. 485,409, Apr. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 252,915, Apr. 10, 1981, abandoned. This application Mar. 31, 1986, Ser. No. 846,824
Int. Cl.[4] G03C 5/24, 5/34
U.S. Cl. 430—331 12 Claims

1. An aqueous metal ion-free developer composition for developing an image in an exposed photoresist consisting essentially of a mixture of a metal ion-free alkali hydroxide as a source of alkalinity and a metal ion-free surfactant, said source of alkalinity being a lower alkyl quaternary ammonium hydroxide and said surfactant being one or more quaternary ammonium compounds that differs from the alkali hydroxide, but conforms to the general formula:

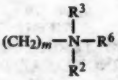


wherein

R^1 is a saturated or unsaturated, straight or branched chain hydrocarbon having from 6 to 20 carbon atoms, and from 0 to 3 atoms, provided that each oxygen atom is separated from another by at least one carbon atom, and which is alkoxy substituted or unsubstituted;

R^2 and R^3 are the same or different where each is selected from the group of alkyl having from 1 to 3 carbon atoms and $(R^5O)_nH$, wherein R^5 is alkylene having from 1 to 3 carbon atoms and n is an integer of from 1 to 20; or R^2 and R^3 together is a member selected from the group of a cycloaliphatic hydrocarbon having from 2 to 8 carbon atoms with from 0 to 2 heteroatoms selected from the group consisting of O, N, and S, provided that each heteroatom is separated from another heteroatom and from the quaternary nitrogen by at least one carbon atom; and a cycloaromatic hydrocarbon having from 2 to 8 carbons with from 0 to 2 nitrogen heteroatoms, provided that each nitrogen is separated from another and from the quaternary nitrogen by at least 1 carbon atom;

R^4 is a member selected from the group of a saturated or unsaturated, straight or branched hydrocarbon having from 1 to 10 carbon atoms; $(R^5O)_nH$ as defined above; phenalkyl, wherein the alkyl moiety has from 0 to 3 carbon atoms; and



where m is an integer of from 1 to 4, R^2 and R^3 are as defined above, and R^6 is a saturated, straight or branched hydrocarbon having from 1 to 10 carbon atoms or $(R^5O)_nH$ as defined above; and

X is a member selected from the group of halo, hydroxy, silicate, and the corresponding amino oxide of said quaternary ammonium compounds;

said alkali being present in sufficient quantity to provide a photoresist developer having a pH of at least 11 and said surfactant being present in a quantity sufficient to reduce the exposure energy required to form a latent image in a

photoresist by at least 20 percent compared to said developer free of said surfactant.

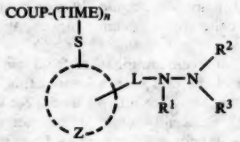
4,628,024

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hidetoshi Kobayashi; Keiji Mihayashi, and Isamu Itoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

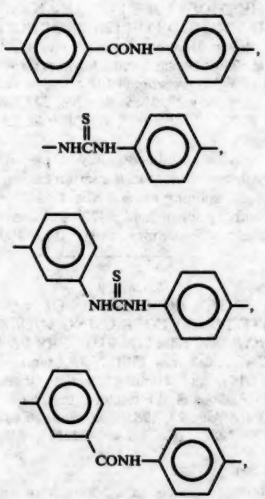
Continuation of Ser. No. 583,901, Feb. 27, 1984, abandoned. This application Jan. 9, 1986, Ser. No. 817,239
Claims priority, application Japan, Feb. 25, 1983, 58-31611
Int. Cl.[4] G03C 1/40
U.S. Cl. 430—376 **19 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer and a compound represented by the following general formula (I):



wherein COUP represents a coupler residue capable of being subjected to a coupling reaction with an oxidation product of an aromatic primary amine developing agent; TIME represents a timing group which is released upon the coupling reaction and subsequently releases

Z represents a 5- or 6-membered monocyclic heterocyclic ring or a 9-membered condensed heterocyclic ring, said heterocyclic ring consisting of nitrogen and carbon atoms; L represents a divalent linking group selected from the groups having the following formulae:



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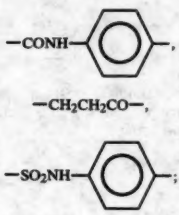


R^1 represents a hydrogen atom or an alkoxycarbonyl group; R^2 represents a hydrogen atom, an alkyl group, an aryl group, a heterocyclic group, an acyl group, a sulfonyl group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, a thioacyl group or a thiocarbamoyl group; R^3 represents a hydrogen atom; R^2 and R^3 may be bonded to each other to form a hydrazone structure; a part of L and R^1 may be bonded to each other to form a hydrazone structure; and n represents 0 or 1.

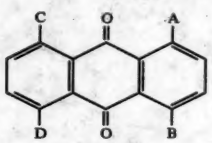
4,628,025

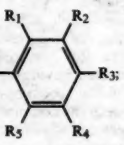
POLYESTER SUPPORT FOR PHOTOGRAPHIC USE

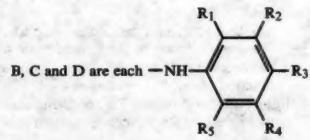
Toshiki Komaita; Takanori Nakadate; Yoshiyuki Funabashi, and Kazuto Kiyohara, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Jul. 12, 1985, Ser. No. 754,258
Claims priority, application Japan, Jul. 13, 1984, 49-146324
Int. Cl.[4] G03C 1/76
U.S. Cl. 430—533 **7 Claims**

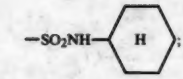
1. A support for photographic use comprizing a polyester film containing at least one compound of the following formula (I) and at least one quaternary ammonium salt of the following formula (II):



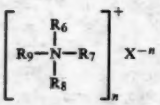




a hydroxyl group, a nitro group, an amino group or a hydrogen atom; R_1, R_2, R_3, R_4 and R_5 are each a hydrogen atom, a halogen atom, an alkoxy group, an alkyl group, an aryloxy group, an aralkoxy group, a hydroxyalkyl group, —$(OCH_2)_mOH$ (m is an integer or 1 to 4) or



B, C and D are not simultaneously at least one member selected from the group consisting of a hydrogen atom, a nitro group and an amino group);



(II)

(wherein R_6, R_7, R_8 and R_9 are each an alkyl group, an aralkyl group or an allyl group; X is an anion; and n represents the number of charges on X).

4,628,026

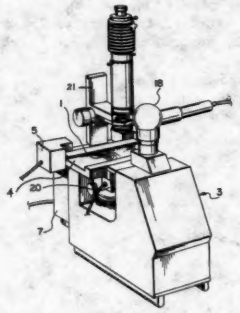
METHOD AND APPARATUS FOR AUTOMATED DOUBLE FLUOROCHROMIZATION ANALYSIS IN LYMPHOCYTOTOXICITY TESTING

Dietlind Gardell, Box 38, Oxford Station, Ontario, K0G 1T0, and Gail Rock, 270 Sandridge Road, Rockcliffe Park, Ottawa, Ontario, K1L 5A2, both of Canada

Filed Nov. 15, 1983, Ser. No. 552,090

Int. Cl.[4] G01N *33/53, 33/554*

U.S. Cl. 435—7 **24 Claims**



1. For use in fluorescence assays of specimens exhibiting fluorescence at two distinguishable wavelength bands when irradiated respectively by light of two pre-selected distinguishable wavelength bands; apparatus comprising:

a movable specimen container having spaced compartments for a plurality of individual specimens to be assayed;

alignment means for moving the container to provide predetermined sequential centered alignment of individual compartments of the container with a predetermined optical path;

irradiating means for sequentially irradiating said specimens, as each is aligned in the optical path, alternately with light of the two pre-selected distinguishable wavelength bands beamed along the optical path;

light collection means for receiving and distinguishing light produced by fluorescence in each said specimen along the optical path;

detector means for detecting and recording the intensity of the light produced by fluorescence of each said specimen at each of said two distinguishable wavelength bands;

analyzing means for calculating the quotient of the intensities of the light sequentially received from each said specimen at the two distinguishable wavelength bands and for comparing such quotient with at least one control quotient thereby to classify such specimen according to such comparison; and

synchronization means for controlling, coordinating and synchronizing the operation of the alignment means, irradiating means, light collection means, detector means and analyzing means.

4,628,027

VITRO DIAGNOSTIC METHODS USING MONOCLONAL ANTIBODIES AGAINST CONNECTIVE TISSUE PROTEINS

Steffen Gay, Birmingham, Ala., assignor to Molecular Engineering Associates, Ltd. and The Board of Trustees of the Universtiy of Alabama, both of Birmingham, Ala.

Continuation of Ser. No. 379,704, May 19, 1982, abandoned. This application Apr. 18, 1984, Ser. No. 601,438

Int. Cl.[4] G01N *33/68, 33/577*

U.S. Cl. 435—7 **60 Claims**

1. A method for immunochemically monitoring the effectiveness of cancer therapy in a human cancer patient, comprising:

(a) reacting a first serum sample taken from said patient prior to initiation of therapy with a known titer of a soluble monoclonal antibody specific for a connective tissue protein which is released by tumor cells of said cancer and is present in an unknown amount in said serum sample;

(b) allowing said antibodies and connective tissue protein to interact to form antigen-antibody complexes in the reaction mixture;

(c) measuring the amount of antigen-antibody complexes formed to determine the amount of said connective tissue protein present in said reaction mixture;

(d) repeating each of said steps on a second serum sample taken from said patient subsequent to the initiation of therapy; and

(e) comparing the amount of said connective tisue protein in said first and second serum samples to determine whether said connective tissue protein has decreased in the interval between the taking of the first and second serum samples, where a decrease reflects successful therapy, thereby monitoring the effectiveness of such therapy in said patient.

4,628,028

NOVEL THERMOSTABLE PULLULANASE ENZYME AND METHOD FOR ITS PRODUCTION

Dennis M. Katkocin, Danbury, Conn.; Nancy W. Zeman, Sleepy Hollow, and Shiow-Shong Yang, Downers Grove, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed May 23, 1985, Ser. No. 737,309

Int. Cl.[4] C12P *19/22, 19/16;* C12N *9/44;* C12R *1/01*

U.S. Cl. 435—95 **8 Claims**

1. A thermostable pullulanase enzyme preparation derived from a *Thermoanaerobium brockii* microorganism, said enzyme being capable of retaining at least about 50% of its pullulan-hydrolyzing activity when held at 70° C. in an aqueous solution in the absence of substrate at pH 5.0 for 100 minutes.

4,628,029

METHOD FOR THE CONVERSION OF A CELLULOSIC SUBSTRATE TO GLUCOSE USING *MICROBISPORA BISPORA*, STRAIN RUTGERS P&W

Douglas E. Eveleigh, Rocky Hill, N.J.; Clarence R. Waldron, Napoleon, Ohio, and Timothy Bartley, Piscataway, N.J., assignors to Parsons & Whittemore, Inc., New York, N.Y.

Filed Aug. 25, 1983, Ser. No. 526,407

Int. Cl.[4] C12P *19/14, 19/02, 1/04;* C12N *9/42, 1/20;* D21C *1/00, 3/00*

U.S. Cl. 435—99 **45 Claims**

41. A cellulase three-enzyme complex of endoglucanase,

cellobiohydrolase and β-glucosidase, produced by the microorganism *Microbispora bispora* Rutgers P&W having accession No. 15568 and mutants thereof which retain cellulolytic activity, having: a β-glucosidase level of activity of at least about 0.1 unit per ml, as measured by a p-nitrophenyl glucoside substrate assay and as derived from a cell free sonicate produced from a 3 day old cell culture broth; substantial resistance to glucose inhibition of its saccharification activity; a functional temperature range of from about 45° C. to about 85° C.; and a functional pH range of about 5.5 to 7.5.

4,628,030

PROCESS FOR THE PRODUCTION OF RHAMNOLIPIDS

Othmar Kaeppeli, Würenlos, and Luis Guerra-Santos, Zurich, both of Switzerland, assignors to Petrotec Forschungs AG, Switzerland

Filed Aug. 9, 1984, Ser. No. 639,377

Claims priority, application Switzerland, Aug. 9, 1983, 4327/83

Int. Cl.⁴ C12P *19/04*; C12R *1/385*

U.S. Cl. 435—101 **17 Claims**

1. In a process for producing rhamnolipids usable as surfactants by the cultivation of rhamnolipid producing microorganisms of the genus Pseudomonas in an aqueous culture medium suitable for the growth of said microorganisms, the improvement which comprises

(a) culturing said microorganisms in a continuous submerged culture under aerobic conditions and with a continuous supply of fresh culture medium, and continuous removal of a solution of partially spent culture medium and produced surfactants, at a dilution rate of below 0.3 h^{-1} and

(b) limiting the amount of at least two essential growth substances selected from the group consisting of carbon, nitrogen, sulfur, phosphorous, sodium, potassium, magnesium, calcium, iron, zinc, manganese, boron, cobalt, copper and molybdenum, in the culture medium such that the quantity of essential growth substance in the partially spent culture medium is less than half of the amount in the fresh culture medium.

4,628,031

THERMOSTABLE STARCH CONVERTING ENZYMES

Joseph G. Zeikus, Okemos, Mich., and Hyung-Hwan Hyun, Madison, Wis., assignors to Michigan Biotechnology Institute, East Lansing, Mich.

Filed Sep. 18, 1984, Ser. No. 652,586

Int. Cl.⁴ C12N *9/34, 9/44*; C12P *19/20, 19/16, 7/14*; C12R *1/145*

U.S. Cl. 435—205 **3 Claims**

1. A method of producing a thermostable glucoamylase and a thermostable pullulanase which comprises anaerobically culturing a thermostable glucoamylase and pullulanase producing *Clostridium thermohydrosulfuricum* in a nutrient medium until substantial enzymatic activity is detectable and thereafter isolating the glucoamylase and pullulanase.

4,628,032

MONOCLONAL ANTIBODY SPECIFIC FOR A MAMMARY TUMOR CYTOPLASMIC ANTIGEN

Christine A. White, Encinitas; Renato Dulbecco, La Jolla, and William R. Allen, Encinitas, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Dec. 5, 1984, Ser. No. 678,260

Int. Cl.⁴ C12N *5/00*; C07K *15/00*

U.S. Cl. 435—240 **2 Claims**

1. A cell line selected from the group consisting of hybridoma cell line 3B18 and antibody-producing reclones thereof.

4,628,033

NOVEL HOST STRAIN FOR TRANSFORMATION OF *YARROWIA LIPOLYTICA*

John R. DeZeeuw, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 6, 1983, Ser. No. 539,363

Int. Cl.⁴ C12N *15/00, 1/00, 1/16*

U.S. Cl. 435—255 **3 Claims**

1. A biologically pure culture of *Yarrowia lipolytica* having the identifying characteristics of ATCC 20688.

4,628,034

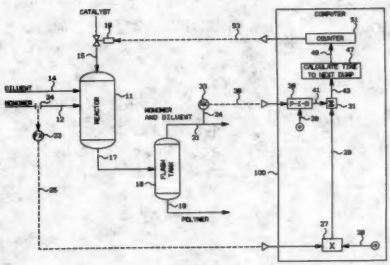
CONTROL OF A POLYMERIZATION REACTION

James A. Hofferber, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 394,089, Jul. 1, 1982, Pat. No. 4,533,517. This application Apr. 30, 1985, Ser. No. 728,913

Int. Cl.⁴ C08F *2/00*; G01N *31/00*

U.S. Cl. 436—55 **4 Claims**



1. A method for maintaining a desired unreacted monomer concentration in the reaction effluent withdrawn from a polymerization reactor, wherein monomer is provided as a feed to said polymerization reactor, wherein catalyst is provided periodically through a catalyst feeder valve to said polymerization reactor and wherein said reaction effluent contains polymer and unreacted monomer, said method comprising the steps of:

establishing a first signal representative of the time which should elapse until the next actuation of said catalyst feeder valve in order to maintain a desired concentration of unreacted monomer in the reaction effluent withdrawn from said polymerization reactor, wherein actuation of said catalyst feeder valve introduces a predetermined volume of catalyst into said polymerization reactor and wherein said first signal is established in part in response to the actual unreacted monomer concentration; and

actuating such catalyst feeder valve when the time represented by said first signal has elapsed to add catalyst to said polymerization reactor so as to maintain a desired concentration of unreacted monomer in the reaction effluent withdrawn from said polymerization reactor.

4,628,035

IMMUNOASSAY METHOD

Daizo Tokinaga; Teruaki Kobayashi, both of Hachioji, and Kazumichi Imai, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 7, 1984, Ser. No. 638,423

Claims priority, application Japan, Sep. 9, 1983, 58-164992

Int. Cl.⁴ G01N *33/543*

U.S. Cl. 436—518 **19 Claims**

1. An immunoassay method for measuring a concentration of an antigen contained in a sample by fixing said antigen with an immobilized antibody according to antigen-antibody reaction, comprising (a) a step of immobilizing an antibody over substantially the whole surface of a supporting matrix for

electrophoresis; (b) a step of moving the antigen in the sample to be measured by electrophoresis with direct current to fix the antigen by the antigen-antibody reaction onto the immobilized antibody; (c) a step of moving a labelled antibody to said fixed antigen by direct current electrophoresis for reaction with said antigen; and (d) a step of measuring an enzyme activity, luminescence, or fluorescence of said labelled antibody to measure the concentration of the antigen in the sample.

4,628,036

IMMUNOLOGICAL ASSAY WITH TEST TUBE HAVING BOTTOM FORMING A STRIP

Antonius H. J. M. Scheepens, Vlijmen; Hans van Hell, Oss, and Hendrikus J. J. Theunissen, Ravenstein, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

PCT No. PCT/NL82/00043, § 371 Date Jun. 21, 1983, § 102(e) Date Jun. 21, 1983, PCT Pub. No. WO83/02009, PCT Pub. Date Jun. 9, 1983

PCT Filed Nov. 24, 1982, Ser. No. 518,801

Claims priority, application Netherlands, Nov. 26, 1981, 8105341

Int. Cl.⁴ G01N *33/555*

U.S. Cl. 436—520 **7 Claims**

1. Method for qualitatively or semi-quantitavely detecting the presence of an antigen or antibody in a test liquid by bringing this test liquid into contact either with an erythrocyte-coupled binding partner of the antigen or antibody to be detected, or with a mixture of an erythrocyte-coupled antigen or erythrocyte-coupled antibody itself and the binding partner of the antigen or antibody to be detected, which is not coupled to a carrier, and thereafter ascertaining the presence or absence of the antigen or antibody in the test liquid from the characteristic sedimentation pattern of the erythrocytes formed at the bottom of a test tube, comprising carrying out the test in a test tube having a bottom in the shape of an inverted prism or trucated prism such that the lower edge of the test tube forms a strip having a length which is at least equal to one-fourth of the distance between two opposite walls of the test tube or at least equal to one-fourth of the diameter of the test tube and wherein the sedimentation pattern is read as formed at the bottom of the test tube.

4,628,037

BINDING ASSAYS EMPLOYING MAGNETIC PARTICLES

Mark S. Chagnon, Lowell; Ernest V. Groman, Brookline; Lee Josephson, Arlington, and Roy A. Whitehead, Hingham, all of Mass., assignors to Advanced Magnetics, Inc., Cambridge, Mass.

Division of Ser. No. 493,991, May 12, 1983, Pat. No. 4,554,488. This application Jun. 13, 1985, Ser. No. 744,351

Int. Cl.⁴ G01N *33/553*

U.S. Cl. 436—526 **11 Claims**

1. A method for determining the concentration of a ligate in a solution which comprises:

(a) reacting the solution, a known amount of labeled ligate, and magnetically-responsive particles to which a ligand specific for the ligate in solution is covalently coupled, to form ligand/ligate complexes;

(b) magnetically separating the magnetically-responsive particles from the reaction solution;

(c) measuring the amount of label associated with the magnetically-responsive particles or remaining free in solution; and

(d) relating the amount of label measured in step (c) to a standard curve to determine ligate concentration,

wherein the magnetically-responsive particles of step (a) individually comprise a magnetic metal oxide core generally surrounded by a coat of polymeric silane, a mass of the particles being dispersable in aqueous media to form an aqueous dispersion having (i) a fifty-percent-turbidity-decrease settling time of greater than about 1.5 hours in the absence of a magnetic field, and (ii) a ninty-five-percent-turbidity-decrease separation time of less than about 10 minutes in the presence of a magnetic field, the magnetic field being applied to the aqueous dispersion by bringing a vessel containing a volume of the dispersion into contact with a pole face of a permanent magnet, the permanent magnet having a volume which is less than the volume of the aqueous dispersion in the vessel.

4,628,038

WATER RESISTANT GLASS FIBERS

Douglas A. Weirauch, Jr., Murrysville, Pa., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 27, 1985, Ser. No. 749,322

Int. Cl.⁴ C03C *13/00*

U.S. Cl. 501—35 **2 Claims**

1. A devitrification resistant and water resistant glass fiber consisting essentially of in approximate weight percent 52.6% to 54.6% SiO_2, 14.5% to 17.5% Al_2O_3, 15.5% to 16.5% CaO, 2% to 3% MgO, 6.5% to 7.5% Na_2O, 2.5% to 4.5% B_2O_3, and 1% or less F_2, and less than 2% TiO_2, Fe_2O_3, K_2O and SO_3 combined, said glass fiber having a delta T of at least about 365° F. and a durability (% fiber weight loss at 96° C.) in water for 24 hours of less than about 0.9%, said glass having a viscosity, in poise, of 10 to the 2.5 power at a temperature of about 2345° F. to about 2385° F.

4,628,039

SINTERED SILICON NITRIDE BODY

Michitaka Mizutani, Tsu, and Kiyoshi Yokoyama, Kokubu, both of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Mar. 5, 1985, Ser. No. 708,349

Claims priority, application Japan, Mar. 6, 1984, 59-43575; Aug. 25, 1984, 59-178089

Int. Cl.⁴ C04B *35/58*

U.S. Cl. 501—97 **7 Claims**

1. A highly oxidation resistant sintered silicon nitride based body consisting essentially of:

(i) 80 to 99.8 mole % of silicon nitride;

(ii)

(a) at least one oxide of an element of the group IIIa of the Periodic Table having an ionic radius smaller than 0.97 Å and

(b) at least one oxide of an element of the group IIIa of the Periodic Table having an ionic radius larger than 0.97 Å,

the total amount of the oxides (a) and (b) being 0.2 to 20 mole % of the sum of components (i) and (ii), and the (a)/(b) molar ratio being within a range of from 10/90 to 90/10, wherein the oxide of Ce and the oxide of Eu are considered to be within category (a) and the oxide of Pr is considered to be within category (b); and

(iii) SiO_2 or an oxide or nitride of an element selected from the group consisting of Al, Ti, Cr, Ga, Zr and elements of the group IIa of the Periodic Table, in an amount of 0.1 to 5 parts by weight per 100 parts by weight of the sum of the components (i) and (ii).

4,628,040

METHOD OF MAKING UNIFORM SPHEROIDAL CATALYST BEADS

Gary J. Green, Yardley, and Albert B. Schwartz, Philadelphia, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 596,990, Apr. 5, 1984. This application Sep. 17, 1985, Ser. No. 776,924
Claims priority, application Canada, Mar. 25, 1985, 477372
Int. Cl.[4] B01J 35/08
U.S. Cl. 502—9 14 Claims

1. A method of producing uniform spheroidal beads from a bead-forming liquid comprising:

supplying said liquid to a capillary tube;

supplying an immiscible fluid which flows through a venturi throat in which the other end of said capillary tube is positioned;

detaching uniform, spherical droplets of said bead-forming liquid from the other end of said capillary tube by said flow of said immiscible fluid; and

hardening said droplets into uniform spheroidal beads.

4,628,041

RHODIUM AND IODINE RECOVERY METHOD

Brad L. Smith, Portland; George P. Torrence, and Adolfo Aguiló, both of Corpus Christi, all of Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 10, 1986, Ser. No. 827,699
Int. Cl.[4] B01J 38/68, 27/08; C07C 53/08, 51/12
U.S. Cl. 502—24 4 Claims

1. A process for the recovery of rhodium and iodine values and the separation of rhodium from corrosion metal salts in the manufacture of acetic acid by the carbonylation of methanol wherein the reaction mixture contains from about none to about 20 wt % of water, from about 2 to about 20 wt % of alkali metal or alkaline earth metal iodide, methanol, acetic acid, methyl iodide, and carbon monoxide which comprises: (1) removing at least a portion of the reaction solution from the reactor, (2) removing at least a portion of the product acetic acid from the portion in (1) by distillation, (3) adding an excess of methyl acetate to the product depleted material in (2) and heating the resultant mixture to a sufficiently high temperature to convert the methyl acetate to methyl iodide (4) removing the resulting methyl iodide by distillation, (5) continuing to heat the resulting mixture at a temperature and time sufficient to precipitate the rhodium as rhodium iodide, and (6) separating the rhodium iodide and returning it to the reaction mixture.

2. The process of claim 1 wherein after the methyl acetate is added, the mixture is heated to from about 130°–190° C. to convert the methyl acetate to methyl iodide.

3. The process of claim 2 wherein the rhodium iodide is precipitated at a temperature of from about 100°–190° C.

4,628,042

POROUS MULLITE

Barry K. Speronello, River Edge, N.J., assignor to Engelhard Corporation, Menlo Park, N.J.

Continuation of Ser. No. 505,650, Jun. 20, 1983, abandoned. This application May 9, 1985, Ser. No. 732,905
Int. Cl.[4] B01J 21/12, 20/16
U.S. Cl. 502—263 21 Claims

1. The method for producing hard porous bodies of synthetic mullite which comprises:

(a) mixing hydrous clay thermally convertible to mullite and free silica or a mixture of hydrous clay and calcined clay thermally convertible to mullite and free silica with a fugitive binder such as water, said hydrous clay being composed of particles having a particle size distribution or being a mixture of particles of hydrous clay and particles of calcined clay such that after step (c), below, the resulting calcined bodies will possess porosity,

(b) forming said mixture into self-supporting green bodies of desired shape and size,

(c) calcining said green bodies at a temperature and for a time sufficient to substantially decompose the kaolin clay into mullite crystals and free silica but insufficient to completely sinter said bodies and to result in calcined bodies having at least 0.1 cc/g of porosity in the range of 30–20,000 Angstrom units,

(d) leaching sufficient free silica from said calcined bodies with alkali without destroying the shape of said bodies and without decomposing said mullite crystals to create pores in the meso-size range in said bodies; and

(e) recovering porous hard bodies comprising mullite.

5. The method of claim 1 wherein the bodies recovered in step (e) have a molar ratio of Al_2O_3/SiO_2 in excess of 0.50 and up to about 1.65, a surface area in the range of about 20 to 60 m^2/g, a total pore volume in excess of 0.15 cc/g an a pore structure in the range of 100 to 600 A characterized by a pore volume in that range of an excess of 0.1 cc/g and the greatest volume of porosity in that range centered around a pore diameter in the range of 150 to 350 Angstrom units.

15. The method of claim 1 comprising the further step of impregnating the bodies from step (e) with a catalytically active material or precursor thereof.

4,628,043

HYPOTHALAMIC GRF AGONISTS

Joachim Spiess, Encinitas; Jean E. F. Rivier, and Wylie W. Vale, Jr., both of LaJolla, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 488,748, Apr. 26, 1983, Pat. No. 4,595,676. This application Mar. 21, 1985, Ser. No. 714,687
Int. Cl.[4] A61K 37/43; C07K 7/10
U.S. Cl. 514—12 20 Claims

1. A synthetic peptide having the formula: H—R_1—Ala—Asp—Ala—Ile—Phe—Thr—R_8—Ser—R-10—Arg—R_{12}—R_{13}—Leu—R_{15}—Gln—Leu—R_1-8—Ala—Arg—Lys—Leu—Leu—R_{24}—R_{25}—Ile—R_{27}—R_2-8—Arg—Gln—Gln—Gly—Glu—R_{34}—Asn—Gln—Glu—R_{38}—R_{39}—R_{40}—Arg—R_{42}—R_{43}—Leu—Y wherein R_1 is Tyr, Met, Leu, D—Tyr, D—His or His; R_8 is Ser or Asn; R_{10} is Tyr or D—Tyr; R_{12} is Arg or Lys; R_{13} is Ile or Val; R_{15} is Gly or D—Ala; R_{18} is Tyr or Ser; R_{24} is His or Gln; R_{25} is Glu or Asp; R_{27} is Met, Ala, Nle, Ile, Leu or Val; R_{28} is Asn or Ser; R_{34} is Arg or Ser; R_{38} is Gln or Arg; R_{39} is Arg or Gly; R_{40} is Ser or Ala; R_{42} is Phe or Ala; R_{43} is Asn or Arg; and Y represents the carboxyl moiety of the amino acid residue at the C-terminus and is the radical —COOR, —CRO, —CONHNHR, —CON(R)(R′) or —CH_2OR, with R and R′ being lower alkyl, fluoro lower alkyl or hydrogen, provided however that at least two but not more than six of the following residues are present: R_8 is Asn, R_{12} is Lys, R_{13} is Val, R_{18} is Ser, R_{24} is Gln, R_{25} is Asp, R_{28} is Ser, or a fragment thereof extending from the N-terminus in a continuous sequence at least to the residue in position 29, which fragment is biologically active to cause the release of GH from the pituitary, or a pharmaceutically acceptable nontoxic salt of such peptide or peptide fragment.

4,628,044

LHRH ANTAGONISTS

Hubert J. J. Loozen, Uden, Netherlands, assignor to Akzo N.V., Netherlands

Filed Aug. 16, 1984, Ser. No. 641,194
Claims priority, application Netherlands, Aug. 16, 1983, 8302875; Jan. 18, 1984, 8400153
Int. Cl.[4] A61K 37/43; C07K 7/20
U.S. Cl. 514—15 4 Claims

1. Peptides of the general formula

X-R^1-R^2-R^3-Ser-Tyr-R^4-R^5-R^6-R^7-R^8-NH_2

wherein

X represents hydrogen or a lower acyl(1–6C) group,

R^1 and R^2 represent either the same or different groups selected from D-3-(benzothien-2-yl)-alanyl, D-3-(benzothien-3-yl)-alanyl, D-3-(1-naphthyl)-alanyl, D-3-(2-naphthyl)-alanyl, D-Phe or D-Phe substituted at the phenyl moiety by one or more halogen, alkyl(1–4C), alkoxy(-1–4C) or nitro groups;

R^3 represents D-Trp, D-3-(benzothien-2-yl)-alanyl, D-3-(benzothien-3-yl)-alanyl, D-3-(1-naphthyl)-alanyl, D-3-(2-naphthyl)-alanyl or D-pyridyl-alanyl, with the proviso that at least one of the symbols R^1 or R^3 represents a D-3-(benzothien-2- or -3-yl)-alanyl group;

R^4 represents D-Arg, D-Lys, D-homo Arg or D-diaklyl (1–4C)-homo Arg;

R^5 represents L-Leu, L-Met, L-cysteine-alkyl(1–4C) or phenylalkyl(7–10C) ether, L-serine-alkyl(1–4C) or phenylalkyl(7–10C) ether or L-homoserine-alkyl(1–4C) or phenylalkyl(7–10C) ether;

R^6 represents L-Lys or L-Arg;

R^7 represents L-Pro or L-thiaprolyl, and

R^8 represents D-Ala or Gly,

and acid addition salts thereof.

4,628,045

IMMUNOTHERAPEUTIC ANTIALLERGIC POLYPEPTIDE AGENTS WHICH BIND TO BASOPHIL IMMUNOGLOBIN FC RECEPTORS

Gary S. Hahn, Solana Beach, Calif., assignor to Immunetech Pharmaceuticals, San Diego, Calif.

Continuation of Ser. No. 746,175, Jun. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 522,601, Aug. 12, 1983, abandoned. This application Feb. 3, 1986, Ser. No. 824,945

Claims priority, application South Africa, Aug. 9, 1984, 84/6192

Int. Cl.[4] A61K *37/02*; C07K *7/06*

U.S. Cl. 514—17 **1 Claim**

1. An active site peptide which blocks immune complex binding to immunoglobulin Fc receptors, said peptide having an amino acid sequence Asp-Ser-Glu-Pro-Arg.

4,628,046

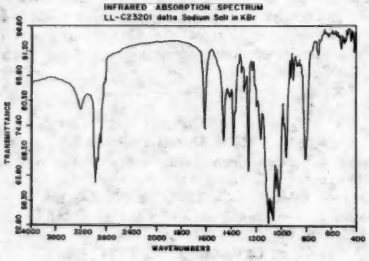
ANTIBIOTIC LL-C232018

David P. Labeda, Monsey; Joseph J. Goodman, Spring Valley, and John H. E. J. Martin, deceased, late of New York, all of N.Y. (by Mary B. Martin, executrix), assignors to American Cyanamid Company, Stamford, Conn.

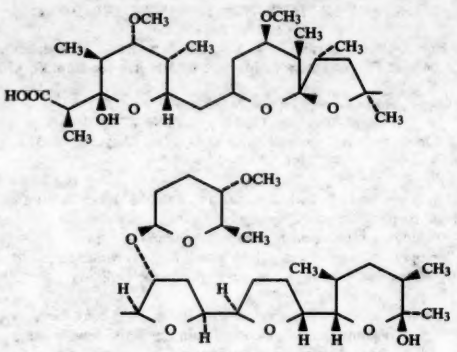
Filed Jun. 20, 1983, Ser. No. 506,170

Int. Cl.[4] A61K *31/71*

U.S. Cl. 514—33 **7 Claims**



7. A method for the control of coccidiosis infections in poultry comprising orally administering to said poultry a coccidially-effective amount of the compound LL-C232018 of the formula



or the pharmaceutically-acceptable salts thereof.

4,628,047

AGENT FOR ENHANCING ANTITUMOR ACTIVITY OF ANTITUMOR AGENT

Yoshio Sakurai, Mitaka, and Takashi Tsuruo, Tokyo, both of Japan, assignors to Japanese Foundation for Cancer Research, Tokyo and Tanabe Seiyaku Co., Ltd., Osaka, both of, Japan

Filed May 27, 1983, Ser. No. 498,639

Claims priority, application Japan, May 28, 1982, 57-91850

Int. Cl.[4] A61K *31/70, 31/55, 31/44*

U.S. Cl. 514—34 **3 Claims**

1. A pharmaceutical composition useful for treating or preventing a tumor selected from the group consisting of chronic lymphatic leukemia, chronic myelogenous leukemia and Hodgkin's disease which comprises 10 mg to 120 mg of diltiazem or a pharmaceutically acceptable acid addition salt thereof and 3 μg to 30 mg of a compound selected from the group consisting of vincristine and doxorubicine.

4,628,048

ORGANOSILYL COMPOUNDS FUNGICIDAL COMPOSITIONS AND USE

Rolf-Dieter Acker, Leimen; Ernst Buschmann, Ludwigshafen; Ernst-Heinrich Pommer, Limburgerhof, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

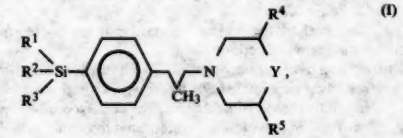
Continuation of Ser. No. 487,313, Apr. 21, 1983, abandoned. This application Mar. 18, 1986, Ser. No. 842,059

Claims priority, application Germany, Apr. 24, 1982, 3215409

Int. Cl.[4] A01N *55/00*; C07F *7/10*

U.S. Cl. 514—63 **2 Claims**

1. A cis organosilyl compound of the formula



(I)

where R^1 and R^3 are n-Cl-3-alkyl and R^2 is n-C_{3-5} alkyl R^4 and R^5 are cis and are identical or different and each is n-C_1–C_5-alkyl and Y is oxygen, or a salt thereof.

4,628,049

FUNGICIDAL COMPOSITION COMPRISING A SYNERGISTIC MIXTURE OF A CYCLOIMIDE FUNGICIDE AND TOLCLOFOS-METHYL

Toshiro Kato, Takarazuka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 18, 1984, Ser. No. 601,684
Claims priority, application Japan, May 13, 1983, 58-84457
Int. Cl.[4] A01N *43/38, 57/10*
U.S. Cl. 514—147 3 Claims

1. A fungicidal composition containing as an active ingredient, 1 to 90% by weight of a mixture of 1 part of N-(3,5-dichlorophenyl)-1,2-dimethylcyclopropane-1,2-dicarboximide and 0.2 to 1.5 parts by weight of 0,0-dimethyl 0-(2,6-dichloro-4-methylphenyl)phosphorothioate, and an inert carrier.

4,628,050

ANTINEPHRITIC PHARMACEUTICAL COMPOSITION CONTAINING 24, 25-DIHYDROXYCHOLECALCIFEROL AS AN ACTIVE INGREDIENT

Yuji Maeda, Nagareyama; Hideyuki Yamato; Takayoshi Fujii, both of Tokyo; Yasuhiko Kobayashi, Niiza; Kenichi Saito; Tadaaki Kato, both of Tokyo, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1985, Ser. No. 800,114
Claims priority, application Japan, Nov. 27, 1984, 59-250313
Int. Cl.[4] A61K *31/59*
U.S. Cl. 514—167 4 Claims

1. A method for the treatment of uremia, renal failure and nephritis, which comprises administering to a patient suffering from uremia, renal failure or nephritis a therapeutically effective amount of a compound of 24,25-dihydroxycholecalciferol.

4,628,051

TRIPHASIC ORAL CONTRACEPTIVE

Samuel A. Pasquale, Basking Ridge, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 607,038, May 4, 1984, Pat. No. 4,544,554, which is a continuation-in-part of Ser. No. 536,135, Sep. 26, 1983, Pat. No. 4,530,839. This application Jun. 11, 1985, Ser. No. 743,344
The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.
Int. Cl.[4] A61K *31/56;* A01N *45/00*
U.S. Cl. 514—170 25 Claims

1. A method of contraception which comprises administering for 21 successive days to a female of childbearing age a combination of an estrogen and a progestogen in a low but contraceptively effective daily dosage corresponding in estrogenic activity to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity to 0.065–0.75 mg of norethindrone for 5–8 days; for the next 7–11 days an estrogen daily dosage equal to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity to 0.250–1.0 mg of norethindrone; and for the next 3–7 days an estrogen daily dosage equal to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity 0.35–2.0 mg of norethindrone; followed by 6–8 days without estrogen and progestogen administration, provided that the estrogen daily dosage is the same for each period.

4,628,052

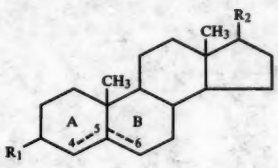
PHARMACEUTICAL COMPOSITIONS CONTAINING DEHYDROEPIANDROSTERONE AND OTHER ANESTHETIC STEROIDS IN THE TREATMENT OF ARTHRITIS AND OTHER JOINT DISABILITIES

Raymond F. Peat, P.O. Box 3427, Eugene, Oreg. 97403

Filed May 28, 1985, Ser. No. 738,482
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—171 15 Claims

1. A method for treating arthritis and joint pain and disability, comprising administering to a patient in need of such treatment a pharmacologically effective dose of dehydroepiandrosterone.

10. A pharmaceutical composition useful for the treatment of arthritis comprising an effective amount of at least one compound selected from the group consisting of the formula:



I

wherein R_1 is O or OH and R_2 is O, or OH; and which may contain one double bond in ring A and/or ring B and tocopherol, in a suitable pharmaceutical carrier.

11. The composition of claim 10 in which said steroid is selected from the group consisting of dehydroepiandrosterone, iso-androsterone, and etiochlolanolone, in a suitable pharmaceutical carrier.

4,628,053

STABILIZED INJECTABLE SOLUTIONS OF PIROXICAM

Walter F. Fries, Illertissen, Fed. Rep. of Germany, assignor to Heinrich Mack Nachf., Illertissen, Fed. Rep. of Germany

Filed Oct. 7, 1985, Ser. No. 784,903
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 3437232
Int. Cl.[4] A61K *31/54*
U.S. Cl. 514—222 6 Claims

1. A stable aqueous injectable solution of piroxicam comprising (A) as the solvent therefor from about 30% to about 50% by volume of propylene glycol, from about 5% to about 15% by volume of ethanol and from about 40% to about 60% by volume of water, based on the total volume of the solvent, said water being present in sufficient amount to total 100%, and (B) as the essential active ingredient therein from about 1% to about 8% by weight of piroxicam, based on the total volume of the solution, together with from about 0.2 mole to about 0.9 mole of D-(−)-N-methylglucamine per mole of piroxicam, said solution having a pH value in the range of from about pH 8 to about pH 9.

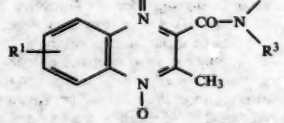
4,628,054

STABILIZING QUINOXALINE DI-N-OXIDES AGAINST LIGHT DEGRADATION

Herbert Voege, Leverkusen, and Hans U. Sieveking, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 520,100, Apr. 4, 1983, abandoned. This application Aug. 19, 1985, Ser. No. 767,012
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230273
Int. Cl.[4] C07D *241/44, 413/06, 403/06;* A61K *31/495*
U.S. Cl. 514—234 11 Claims

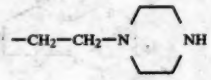
1. A composition consisting essentially of a quinoxaline di-N-oxide of the formula



wherein

R^1 represents a hydrogen or chlorine atom or a lower alkyl group of lower alkoxy group,

R^2 represents a straight-chain or branched alkyl radical which has 1 to 6 carbon atoms and is optionally substituted by a hydroxyl, lower alkoxy, lower alkylamino or lower dialkylamino group, or represents the group

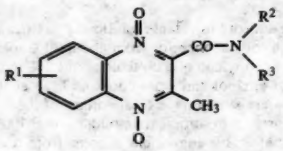


and

R^3 represents a hydrogen atom or a straightchain or branched alkyl radical which has 1 to 6 carbon atoms and is optionally substituted by a hydroxyl, lower alkoxy, lower alkylamino or lower dialkylamino group, or in which R^2 and R^3, together with the amide nitrogen atom to which they are attached, can form a pyrrolidino, piperidino, morpholino or piperazino radical; it being possible for the latter to be substituted in the 4-position by a lower alkyl radical; lower alkyl or alkoxy groups being understood in all cases to mean groups having 1 to 4 carbon atoms,

and a light stablizing amount of a substance which absorbs light within the wavelength range from 200 to 450 nm and selected from the group consisting of quiuronium sulphate, tartrazine XX, rutin, sodium salt of fluorescein, water-soluble bixin and sodium alizarin sulphonate.

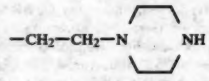
9. In the administration of a quinoxaline di-N-oxide of the formula



wherein

R^1 represents a hydrogen or chlorine atom or a lower alkyl group or lower alkoxy group,

R^2 represents a straight-chain or branched alkyl radical which has 1 to 6 carbon atoms and is optionally substituted by a hydroxyl, lower alkoxy, lower alkylamino or lower dialkylamino group, or represents the group



and

R^3 represents a hydrogen atom or a straightchain or branched alkyl radical which has 1 to 6 carbon atoms and is optionally substituted by a hydroxyl, lower alkoxy, lower alkylamino or lower dialkylamino group, or in which R^2 and R^3, together with the amide nitrogen atom to which they are attached, can form a pyrrolidino, piperidino, morpholino or piperazino radical; it being possible for the latter to be substituted in the 4-position by a lower alkyl radical; lower alkyl or alkoxy groups being understood in all cases to mean groups having 1 to 4 carbon atoms, to an animal by dissolving the quinozaline di-N-oxide in water and then adding the solution to the animal's drinking water or food product, the improvement which comprises adding to the solution a substance which absorbs light within the wavelength range from 200 to 450 nm and selected from the group consisting of quiuronium sulphate, tartrazine XX, rutin, sodium salt of fluorescein, water-soluble bixin and sodium alizarin sulphonate.

4,628,055

METHOD FOR TREATING ALLERGIC REACTIONS AND COMPOSITIONS THEREFORE

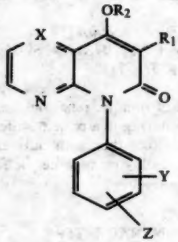
Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 533,674, Sep. 19, 1983, Pat. No. 4,492,702, which is a continuation-in-part of Ser. No. 438,681, Nov. 3, 1982, abandoned. This application Oct. 15, 1984, Ser. No. 661,017

Int. Cl.[4] **C07D** *471/04, 487/04;* **A61K** *31/495, 31/44*

U.S. Cl. 514—249 **41 Claims**

1. A method for treating allergic reactions in a mammal which method comprises administering an anti-allergic effective amount of a compound having the structural formula I



I

wherein

X is N;

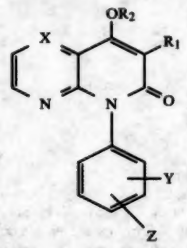
Y is hydrogen, hydroxy, benzyloxy, amino, sulfamyl, halogen, nitro, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, carboxylic acyl having from 2 to 6 carbon atoms, alkyl—$S(O)_m$— having from 1 to 6 carbon atoms wherein m is 0, 1 or 2, trifluoromethyl, trifluoromethylthio, or COOA wherein A is hydrogen, alkyl having from 1 to 6 carbon atoms or a cation derived from a pharmaceutically acceptable metal or an amine;

Z is hydrogen, hydroxy, halogen, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, hydroxyalkyl having from 1 to 6 carbon atoms, or carboxylic acyloxy having from 2 to 6 carbon atoms;

R_1 is alkenyl having from 2 to 10 carbon atoms, alkynyl having from 2 to 10 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms, cycloalkenyl having from 5 to 8 carbon atoms, carboxylic acyl having from 2 to 6 carbon atoms or alkyl having from 1 to 10 carbon atoms which may be substituted with hydroxy, halogen, alkoxy having from 1 to 6 carbon atoms, phenyl, carboxylic acyl having from 2 to 6 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms or carboxylic acyloxy having from 1 to 6 carbon atoms;

R_2 is hydrogen, carboxylic acyl having from 1 to 6 carbon atoms, alkenyl having from 3 to 8 carbon atoms, alkynyl having from 3 to 8 carbon atoms, $R_aR_bN(CH_2)_n$— (wherein R_a and R_b are hydrogen, alkyl having from 1 to 6 carbon atoms and n is an integer of from 2 to 6) hydroxyalkyl having from 2 to 6 carbon atoms, dihydroxyalkyl having from 2 to 6 carbon atoms, hydroxyalkoxyalkyl having from 2 to 8 carbon atoms, or a cation derived from a pharmaceutically acceptable metal or an amine.

10. A compound having the structural formula I



wherein

X is N;

Y is hydrogen, hydroxy, benzyloxy, amino, sulfamyl, halogen, nitro, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, carboxylic acyl having from 2 to 6 carbon atoms, alkyl—$S(O)_m$— having from 1 to 6 carbon atoms wherein m is 0, 1 or 2, trifluoromethyl, trifluoromethylthio, or COOA wherein A is hydrogen, alkyl having from 1 to 6 carbon atoms or a cation derived from a pharmaceutically acceptable metal or an amine;

Z is hydrogen, hydroxy, halogen, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, hydroxyalkyl having from 1 to 6 carbon atoms, or carboxylic acyloxy having from 2 to 6 carbon atoms;

R_1 is alkenyl having from 2 to 10 carbon atoms, alkynyl having from 2 to 10 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms, cycloalkenyl having from 5 to 8 carbon atoms, carboxylic acyl having from 3 to 6 carbon atoms or alkyl having from 1 to 10 carbon atoms which may be substituted with a substituent selected from hydroxy, halogen, alkoxy having from 1 to 6 carbon atoms, phenyl, carboxylic acyl having from 2 to 6 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms or carboxylic acyloxy having from 1 to 6 carbon atoms;

R_2 is hydrogen, carboxylic acyl having from 1 to 6 carbon atoms, alkenyl having from 3 to 8 carbon atoms, alkynyl having from 3 to 8 carbon atoms, $R_aR_bN(CH_2)_n$— (wherein R_a and R_b are hydrogen, alkyl having from 1 to 6 carbon atoms and n is an integer of from 2 to 6) hydroxyalkyl having from 2 to 6 carbon atoms, dihydroxyalkyl having from 2 to 6 carbon atoms, hydroxyalkoxyalkyl having from 2 to 8 carbon atoms, or a cation derived from a pharmaceutically acceptable metal or an amine.

4,628,056

NOVEL OXOPYRIMIDINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND THEIR USE AS ANTICONVULSANT, ANTIANXIETY AND MUSCLE RELAXANT AGENTS

Barrie Levitt, Haifa, and Morris Stolar, Tel Aviv, both of Israel, assignors to Taro Pharmaceutical Industries Ltd., Israel

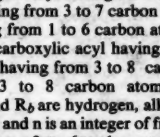
Filed Sep. 5, 1984, Ser. No. 647,680

Claims priority, application Israel, Sep. 14, 1983, 69722

Int. Cl.[4] A61K *31/515;* **C07D** *239/62, 239/64*

U.S. Cl. 514—270 **10 Claims**

1. A compound of formula I:



wherein R_1 and R_2 may be the same or different and are each hydrogen or lower alkyl optionally substituted by lower alkoxy, and R_3 and R_4 may be the same or different and are each phenyl, phenyl substituted by lower alkyl or phenyl substituted by halogen provided that when R_1 and R_2 are both hydrogen R_3 and R_4 are each a substituted phenyl; and addition salts thereof.

8. A method of treating convulsion in mammals comprising administering to a patient an effective amount of a compound of the general formula I as defined in claim 1.

9. A method of effecting muscle relaxation in mammals comprising administering to a patient an effective amount of a compound of the general formula I as defined in claim I.

10. A method of treating anxiety in mammals comprising administering to mammals an effective amount of a compound of the general formula I as defined in claim 1.

4,628,057

TETRAHYDRO-β-CARBOLINE DERIVATIVES AND TREATMENT OF LIVER DISEASES

Ikuo Iijima, Urawa; Yutaka Saiga, Ageo; Toshikazu Miyagishima, Wako; Yuzo Matsuoka, Tondabayashi, and Mamoru Matsumoto, Nara, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

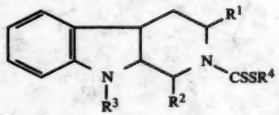
Filed Oct. 30, 1984, Ser. No. 666,481

Claims priority, application United Kingdom, Nov. 12, 1983, 8330260

Int. Cl.[4] A61K *31/395;* **C07D** *471/02*

U.S. Cl. 514—292 **27 Claims**

1. A tetrahydro-β-carboline derivative of the formula:



wherein

R^1 is carboxyl, a lower alkoxycarbonyl, carbamoyl, an N,N-di-lower alkylcarbamoyl, an N-(phenyl-substituted lower alkylidenamino)carbamoyl, an [N,N-di(lower alkyl)-amino]-lower alkyl, or a tetrazolyl;

R^2 is a hydrogen atom, a lower alkyl, or a hydroxy-lower alkyl group, or

R^2 is combined with R^1 to form a group —CO—O—CH_2—;

R^3 is a hydrogen atom, a lower alkyl, a phenyl-lower alkyl, or a group of the formula: —CCS—R^4;

R^4 is a hydrogen atom, a C1–C10 alkyl group, or a group of the formula: —$(CH_2)_nY^1$;

n is 0, 1 or 2,

Y^1 is a lower alkenyl, a phenyl-substituted lower alkenyl, an N,N-di(lower alkyl)amino, a lower alkylmercapto, a lower alkoxycarbonyl, benzoyl, naphthyl, a cycloalkyl of 5 to 6 carbon atoms, thienyl, furyl, pyridyl, phenyl, or a phenyl having one or two substituents selected from the group consisting of a halogen, amino, benzloxycarbonylamino, formylamino, a lower alkoxy, nitro, a lower alkyl, carboxyl and a halogenated lower alkyl group, or a pharmaceutically acceptable salt thereof.

4,628,058

N-(2,3-DIHYDROBENZOFURAN-2-YL)-AZOLYLUREAS AND FUNGICIDES CONTAINING THESE COMPOUNDS

Costin Rentzea, Heidelberg; Stefan Karbach; Eberhard Ammermann, both of Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

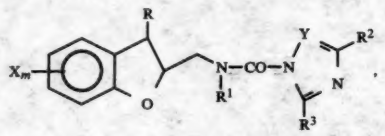
Filed Mar. 19, 1985, Ser. No. 713,642

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1984, 3410925

Int. Cl.[4] A01N *47/38*; C07D *405/12*

U.S. Cl. 514—383 **4 Claims**

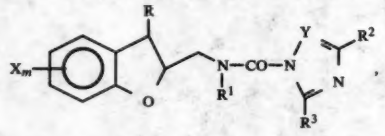
1. An N-((2,3-dihydrobenzofuran)-2-yl)-azolylurea of the formula



I

where R is hydrogen or alkyl of 1 to 4 carbon atoms, X is hydrogen, halogen, nitro, cyano, trifluoromethyl or alkyl, alkoxy or alkylthio, each of 1 to 4 carbon atoms, or phenyl or phenoxy, m is an integer from 1 to 4, the individual groups X being identical or different when m is greater than 1, and Y is CH or N, R^1 is alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl, cycloalkyl or cycloalkylalkyl, each of not more than 12 carbon atoms, or phenyl or benzyl, each of which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, nitro or cyano, and R^2 and R^3 are identical or different and are each hydrogen or alkyl of 1 to 5 carbon atoms.

4. A process for combatting fungi, wherein the fungi or the materials, areas, plants or seed threatened by fungus attack are treated with a fungicidally effective amount of an N-((2,3-dihydrobenzofuran)-2-yl)-azolylurea of the formula



I

where R is hydrogen or alkyl of 1 to 4 carbon atoms, X is hydrogen, halogen, nitro, cyano, trifluoromethyl or alkyl, alkoxy or alkylthio, each of 1 to 4 carbon atoms, or phenyl or phenoxy, m is an integer from 1 to 4, the individual groups X being identical or different when m is greater than 1, and Y is CH or N, R^1 is alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl, cycloalkyl or cycloalkylalkyl, each of not more than 12 carbon atoms, or phenyl or benzyl, each of which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, nitro or cyano, and R^2 and R^3 are identical or different and are each hydrogen or alkyl of 1 to 5 carbon atoms.

4,628,059

DOPAMINE-β-HYDROXYLASE INHIBITORS

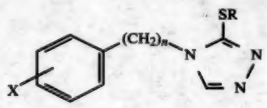
Joseph A. Finkelstein, Philadelphia, Pa.; Carl Kaiser, Haddon Heights, and Lawrence I. Kruse, Haddonfield, both of N.J., assignors to SmithKlein Beckman Corporation, Philadelphia, Pa.

Filed Oct. 31, 1985, Ser. No. 793,513

Int. Cl.[4] A61K *31/41*; C07D *249/08*

U.S. Cl. 514—384 **21 Claims**

1. A compound represented by the Formula:



in which:

n is 0–5;

R is hydrogen or C_{1-4} alkyl; and

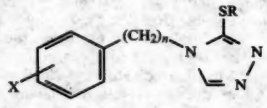
X is hydrogen, halo, C_{1-4} alkyl, CN, NO_2, SO_2NH_2, COOH, CHO, CH_2OH, OH, C_{1-4} alkoxy, CF_3, SO_2CH_3, SO_2CF_3, or $CO_2C_aH_{2a+1}$ wherein a is 1–5, or any accessible combination thereof of up to 5 substituents; or any pharmaceutically acceptable salt or hydrate thereof;

except compounds in which:

n is O and X is hydrogen, CH_3, OCH_3, OCH_2CH_3, $OCH_2CH_2CH(CH_3)_2$, Br, Cl, F, I, CF_3, NO_2, COOH, or combinations thereof; and

n is 1 and X is hydrogen.

15. A method of inhibiting dopamine-β-hydroxylase activity in mammals that comprises administering internally to a subject in need of such inhibition an effective amount of a compound having the Formula:



in which:

n is 0–5;

R is hydrogen or C_{1-4} alkyl; and

X is hydrogen, halo, C_{1-4} alkyl, CN, NO_2, SO_2NH_2, COOH, CHO, CH_2OH, OH, C_{1-4} alkoxy, CF_3, SO_2CH_3, SO_2CF_3, or $CO_2C_aH_{2a+1}$ wherein a is 1–5, or any accessible combination thereof of up to five substituents; or any pharmaceutically acceptable salt or hydrate thereof.

4,628,060

FUNGICIDAL TETRAHYDROTHIOPYRAN-3,5-DIONE DERIVATIVES, INTERMEDIATE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREFOR

Herbert Gayer, Monheim; Wolfgang Krämer, Wuppertal; Wilhelm Brandes, Leichlingen; Gerd Hänssler, and Paul Reinecke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

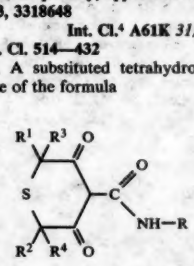
Filed May 2, 1984, Ser. No. 606,316

Claims priority, application Fed. Rep. of Germany, May 21, 1983, 3318648

Int. Cl.[4] A61K *31/38*; C07D *335/02*

U.S. Cl. 514—432 **16 Claims**

1. A substituted tetrahydrothiopyran-3,5-dione-4-carboxamide of the formula



in which

R is alkyl having up to 8 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, aralkyl which is optionally substituted and has 1 or 2 carbon atoms in the alkyl moiety and 6 to 10 carbon atoms in the aryl moiety, and aryl which is

optionally substituted and has 6 to 10 carbon atoms, aryl substituents in each case independently being halogen, cyano, nitro, alkyl, alkoxy and alkylthio each having up to 4 carbon atoms, halogenoalkyl, halogenoalkoxy and halogenoalkylthio each having 1 or 2 carbon atoms and up to 5 identical or different halogen atoms, dioxyalkylene which is optionally substituted by halogen or lower alkyl and has 1 or 2 carbon atoms in the alkylene radical, phenoxy which is optionally substituted by halogen, lower alkyl and lower halogenoalkyl, and alkoxycarbonylalkyl and alkoxycarbonylalkenyl each having 1 or 2 carbon atoms in the alkoxy moiety and each having up to 2 carbon atoms in the alkyl or alkenyl moiety,

R^1, R^2 and R^3 each independently is hydrogen or alkyl having up to 6 carbon atoms, and

R^4 is alkyl having 1 to 6 carbon atoms

excepting the compounds in which

R^1 and R^3 are hydrogen

R^4 is methyl,

R is alkyl, phenyl or phenyl which is substituted by halogen and/or methyl, and

R^2 is hydrogen or methyl.

14. A method of combatting fungi which comprises administering to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim **1**.

15. The method according to claim **14**, wherein such compound is

2-isopropyltetrahydrothiopyran-3,5-dione-4-[N-3,4-dichlorophenyl)]-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-(N-tert.-butyl)-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-(N-p-tolyl)-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-[N-(3-trifluoromethylphenyl)]-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-[N-(3-nitrophenyl)]-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-[N-(4-chlorophenyl)]-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-[N-(3,4-dichlorophenyl)]-carboxamide,

2,6-methyltetrahydrothiopyran-3,5-dione-4-[N-(3-chloro-4-trifluoromethylphenyl)]-carboxamide,

2-isopropyl-6-methyl-tetrahydrothiopyran-3,5-dione-4-[N-(4-chlorophenyl)]-carboxamide or

2-isopropyl-6-methyl-tetrahydrothiopyran-3,5-dione-4-[N-3,4-dichlorophenyl)]-carboxamide.

4,628,061

PROSTAGLANDINS

Robert L. Jones, and Norman H. Wilson, both of Edinburgh, Scotland, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB82/00348, § 371 Date Aug. 23, 1983, § 102(e) Date Aug. 23, 1983, PCT Pub. No. WO83/02273, PCT Pub. Date Jul. 7, 1983

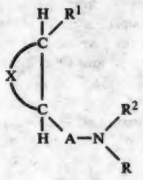
PCT Filed Dec. 10, 1982, Ser. No. 531,899

Claims priority, application United Kingdom, Dec. 23, 1981, 8138715

Int. Cl.[4] **C07D** *493/08, 177/00;* **C07C** *177/00;* **A61K** *31/34, 31/215*

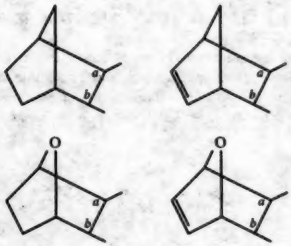
U.S. Cl. 514—469 **38 Claims**

1. A compound of formula (I)



wherein

represents one of the cyclic groups shown below;



the letters a and b indicating in each case the points of attachment of the substituents R^1 and A—NR^2R, respectively; R^1 is a 6-carboxyhex-2-enyl group, or a modification thereof in which the group is altered by one, or an appropriate combination of two or more of the following: (a) alteration of the position of the double bond from the 2,3-position to the 3,4-position, (b) reduction of the double bond, (c) replacement of a methylene group at position 2 or 3 by an oxygen or sulphur atom in conjunction with reduction of the double bond, (d) alteration of the chain length through a decrease or an increase of one or two methylene groups, and (e) formation of a derivative of the carboxy group in the form of a pharmaceutically acceptable salt, C_{1-10} alkyl ester or an amide containing a group —$CONH_2$ or such a group in which the nitrogen atom is substituted by one or two groups selected from C_{1-10} alkyl groups, phenyl and phenyl substituted by one or more substituents selected from C_{1-10} alkoxy, halogen, C_{1-10} halogen-substituted alkyl, sulfamyl, amino, hydroxyl, nitro and C_{1-10} alkyl groups, or by one group —SO_2R^6 in which R^6 is a C_{1-10} alkyl group; A is an aliphatic C_{1-10} hydrocarbon group with a chain length between the points of attachment to the divalent cyclic group and to the group NR^2R of 1 to 5 carbon atoms or such a group substituted by a group Ar, where Ar represents a phenyl, naphthyl, fluorenyl, dibenzocyclohexyl, dibenzocycloheptyl, pyridyl, benzthiazolyl, dihydrobenzthiazolyl, N-methyldihydrobenzthiazolyl, benzoxazolyl, dihydrobenzoxazolyl or N-methyldihydrobenzoxazolyl group or such a group substituted by one or more substituents selected from C_{1-10} alkoxy, halogen, C_{1-10} halogen-substituted alkyl, sulfamyl, amino, hydroxyl, nitro and C_{1-10} alkyl groups; R_2 is hydrogen, a C_{1-10} aliphatic hydrocarbon group, a group Ar or a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups Ar; and R is a group —$CO.NR^3R^4$, —$CS.NR^3R^4$,

—CNH.NR^{3}R^4, —CO.R^4 or —CS.R^4 in which R^3 is hydrogen, a C_{1-10} aliphatic hydrocarbon group, a group Ar or a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups Ar, but with the proviso that both R^2 and R^3 may not be other than hydrogen, and R^4 is a C_{1-10} aliphatic hydrocarbon group, a group Ar or a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups Ar and/or by a group OAr, SAr, OR^5 or SR^5 wherein R^5 is a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups Ar.

4,628,062

1,4-NAPHTHOQUINONE DERIVATIVES HAVING ANTI-INFLAMMATORY ACTION

Wolfgang Opitz, Overath; Bernhard Pelster, St. Augustin; Romanis Fruchtmann, Cologne; Udo Krupka, Marburg; Walter Gauss, Cologne; Hartmut Kiehne, Odenthal, and Hermann Oediger, Cologne, all of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co., KG, Cologne, Fed. Rep. of Germany

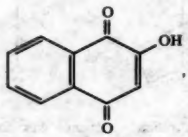
Filed Dec. 17, 1984, Ser. No. 682,408

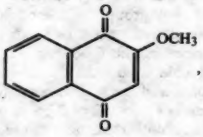
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1983, 3347658

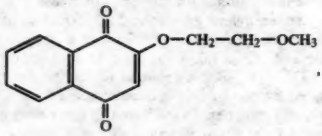
Int. Cl.^{4} A61K *31/12*; C07C *50/14, 97/22*

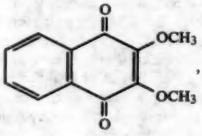
U.S. Cl. 514—569 **15 Claims**

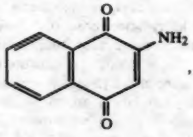
1. An anti-inflammatory composition in the form of a tablet, coated tablet, capsule, pill, suppository or ampule and comprising a diluent and an anti-inflammatory effective amount of a compound selected from the group consisting of











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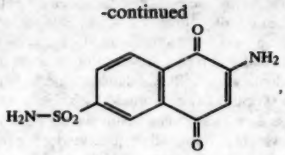
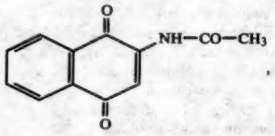
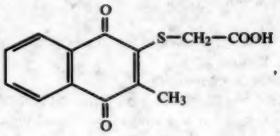
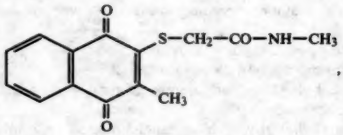
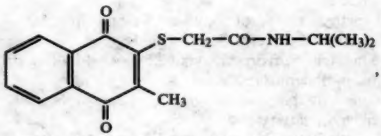
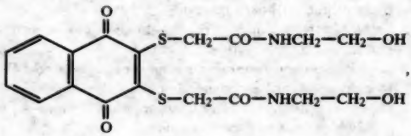


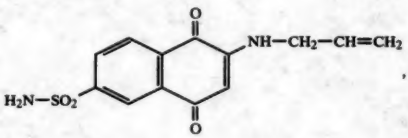


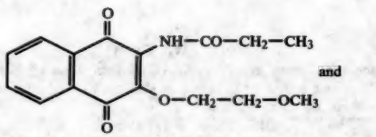


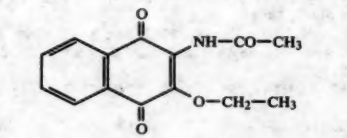












and

4,628,063

ANTIVIRAL PHARMACEUTICAL PREPARATIONS AND METHODS FOR THEIR USE

Harold G. Haines, and Caroline B. Dickens, both of Miami, Fla., assignors to Dana P. Brigham, Miami Lakes, Fla.

Filed Mar. 8, 1984, Ser. No. 587,398
Int. Cl.[4] A61K *31/16, 31/195*
U.S. Cl. 514—626 8 Claims

1. A method of treating herpes virus infections in a mammal which comprises administering to said mammal an effective antiviral amount of a mixture comprising;

(a) lidocaine or a pharmaceutically acceptable salt thereof in a concentration of 0.5 to 10% w/v, and

(b) pantothenol or a pharmaceutically acceptable salt thereof in a synergistically effective amount of at least 3% w/v producing an enhancemcnt in the antiviral effect.

4,628,064

EPININE AND THE THERAPEUTIC USE THEREOF

Cesare Casagrande, Arese; Paolo Ghirardi, Milan, both of Italy; Leon I. Goldberg, Chicago, Ill., and Germano Marchetti, Milan, Italy, assignors to SIMES, Societa Italiana Medicinali e Sintetici S.p.A., Milan, Italy

Filed Jul. 17, 1984, Ser. No. 631,751
Claims priority, application Italy, Jul. 19, 1983, 22118 A/83
Int. Cl.[4] A61K *31/135*
U.S. Cl. 514—654 5 Claims

1. A method for stimulated heart contractility, vasodilation of the circulatory system and bronchodilation, for treating congestive heart failure in man comprising administering epinine or a pharmaceutical salt thereof at a dose corresponding to from 0.5 to 5 μg/kg/min. of epinine.

4,628,065

PROCESS FOR METHANOL SYNTHESIS FROM CARBON OXIDES AND HYDROGEN IN THE PRESENCE OF A SOLUBLE COPPER AND ZINC CATALYST

Didier Prouteau, Aubergenville; Francois Hagues, Nanterre; Yves Chauvin, Le Pecq, and Dominique Commereuc, Meudon, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 21, 1985, Ser. No. 747,206
Claims priority, application France, Jun. 21, 1984, 84 09942
Int. Cl.[4] C07C *27/06, 31/04*
U.S. Cl. 518—700 20 Claims

1. In a catalytic process for manufacturing methanol comprising reacting carbon oxides with hydrogen, in an inert liquid medium, the improvement wherein the reaction is conducted in the presence of a catalyst soluble in said medium, said catalyst obtained by interaction of at least one copper compound, with at least one zinc compound of zero valence having the formula ZnR_2, wherein each R is a monovalent hydrocarbon or alkoxy with the provision that at least one R is a monovalent hydrocarbon and wherein the interaction of the zerovalent zinc compound with the copper compound is conducted in an inert liquid medium and unnder a non-oxidizing atmosphere.

4,628,066

PROCESS FOR THE PRODUCTION OF METHANOL

Leo W. Bonnell, Macungie, and Joseph M. Pietrantonio, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 12, 1986, Ser. No. 828,920
Int. Cl.[4] C07C *27/06, 31/04*
U.S. Cl. 518—700 13 Claims

1. In a gas phase synthesis loop for the production of methanol from a syngas feed containing carbon dioxide and hydrogen, the improvement for increasing the capacity of methanol production which comprises:

(a) passing said syngas feed, in a single pass, to a liquid phase methanol reactor to convert a portion of the syngas to methanol, thereby forming a methanol-containing syngas reactor effluent;

(b) cooling said methanol-containing syngas reactor effluent to condense the methanol, thereby producing a first methanol stream and an unreacted syngas stream;

(c) passing said unreacted syngas stream to a gas phase synthesis loop to produce a second methanol stream; and

(d) recovering both the first and second methanol streams.

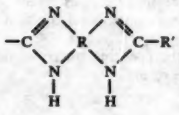
4,628,067

MICROPOROUS POLYBENZIMIDAZOLE PARTICULATES

Paul N. Chen, Sr., Charlotte, and Richard O. Tucker, Oakboro, both of N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,022
Int. Cl.[4] B01J *39/18;* C08G *2/30;* C08L *77/06*
U.S. Cl. 521—25 27 Claims

1. Microporous particles of polybenzimidazole resins selected from a group consisting of polybenzimidazoles and modified polybenzimidazoles functionalized by treatment with an organic or inorganic acid, said polybenzimidazole resin consisting essentially of reoccurring units selected from the formula:

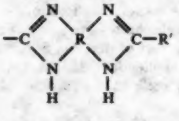


wherein R is a tetravalent aromatic nucleus, preferably symmetrically substituted, with the nitrogen atoms forming the benzimidazole rings being paired upon adjacent carbon atoms, i.e., ortho carbon atoms, of the aromatic nucleus, and R′ is a member of the class consisting of (1) an aromatic ring, (2) an alkylene group, and (3) a heterocyclic ring from the class consisting of (a) pyridine, (b) pyrazine, (c) furan, (d) quinoline, (e) thiophene. and (f) pyran, and the formula

wherein Z is an aromatic nucleus having the nitrogen atoms forming the benzimidazole ring paired upon adjacent carbon atom of the aromatic nucleus, said microporous particles being characterized by a reduced bulk density, a specific surface area of at least about 10 m^2/g, a porosity of at least about 10%, and an average pore diameter of from about 50 to about 500 angstroms.

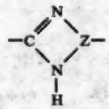
11. A process for the preparation of microporous particles of polybenzimidazole resin suitable for use as the stationary phase in chromatographic processes or supported chemical reactions, comprising the steps of:

(a) forming in a suitable solvent a 2 to about 10% solution of a polybenzimidazole resin consisting essentially of reoccurring units selected from the formula:



wherein R is a tetravalent aromatic nucleus, preferably symmetrically substituted, with the nitrogen atoms form-

ing the benzimidazole rings being paired upon adjacent carbon atoms, i.e., ortho carbon atoms, of the aromatic nucleus, and R' is a member of the class consisting of (1) an aromatic ring, (2) an alkylene group, and (3) a heterocyclic ring from the class consisting of (a) pyridine, (b) pyrazine, (c) furan, (d) quinoline, (e) thiophene, and (f) pyran, and the formula:



wherein Z is an aromatic nucleus having the nitrogen atoms forming the benzimidazole ring paired upon adjacent carbon atoms of the aromatic nucleus;

(b) emulsifying said polybenzimidazole solution with a non-polar organic solvent in a volume ratio of polybenzimidazole solution to non-polar organic solvent of from about 1:2 to about 1:4 under conditions of shear sufficient to produce substantially spherical droplets of polybenzimidazole resin;

(c) precipitating said spherical droplets of polybenzimidazole resin from said emulsion in the form of substantially spherical microporous beads by contacting said emulsion with a non-solvent for said polybenzimidazole resin; and

(d) recovering the resulting microporous particles of polybenzimidazole resin.

4,628,068

ANTI-STATIC STYRENE POLYMER PARTICLES BY COATING

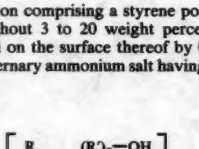
Haven S. Kesling, Jr., Drexel Hill, and James J. Harris, West Chester, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 812,091, Dec. 23, 1985, Pat. No. 4,603,149. This application May 1, 1986, Ser. No. 858,334

Int. Cl.[4] C08J *9/22*

U.S. Cl. 521—57 **6 Claims**

1. A composition comprising a styrene polymer containing dispersed throughout 3 to 20 weight percent of a blowing agent and coated on the surface thereof by 0.1 to 0.4 weight percent of a quaternary ammonium salt having general formula



wherein R may be C_1–C_{11} linear or branched alkyl groups and mixtures thereof, R' may be oxyethylene, oxypropylene, oxybutylene and mixtures thereof, R'' may be C_1–C_4 linear or branched alkyl or benzyl, x may be an integer from 1 to 20, and A may be any anion.

4,628,069

POLYAMIDES CONTAINING PHENOLIC COMPOUNDS

Rolf-Volker Meyer; Friedrich Fahnler; Rolf Dhein, and Dietrich Michael, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 561,301, Dec. 14, 1983, abandoned. This application May 23, 1985, Ser. No. 737,103

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248329

Int. Cl.[4] C08K *5/13*

U.S. Cl. 524—339 **5 Claims**

1. A thermoplastic polyamide moulding composition consisting essentially of (i) one polyamide and (ii) from 3 to 15% by weight, based on polyamide, an unsubstituted or substituted C_{10}–C_{22} sterically unhindered monophenolic compound, which when substituted is substituted in at most of one o-position by one or more C_1–C_{12} alkyl or C_7–C_{15} aralkyl groups, or hydroxy diphenyls or hydroxy triphenyls optionally substituted by one or more C_1–C_6 alkyl group, the rings of which may optionally be attached through —O— or C_1–C_3 alkylene.

4,628,070

VINYL CHLORIDE RESIN-BASED COMPOSITION FOR FLOPPY DISC JACKET

Tohru Yokota, Ibaraki; Kaname Inoue, Kanagawa; Ryozo Tanizawa, Tokyo; Hideyuki Asou, Ibaraki, and Hajime Kitamura, Chiba, all of Japan, assignors to Shin Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,354

Claims priority, application Japan, Feb. 6, 1985, 60-21473

Int. Cl.[4] C08K *3/04;* **C08L** *39/04, 51/00, 53/00*

U.S. Cl. 524—504 **3 Claims**

1. A vinyl chloride resin-based composition for floppy disc jackets having a Clash-Berg temperature of 75° C. or higher which comprises:

(A) 100 parts by weight of a vinyl chloride-based resin base composed of

(a) 10 to 100% by weight of a copolymer of vinyl chloride and a N-substituted maleimide in a weight proportion of 50:50 to 95:5 having an average degree of polymerization in the range from 400 to 1000, and

(b) up to 90% by weight of a polyvinyl chloride resin having an average degree of polymerization in the range from 400 to 1000;

(B) from 1 to 20 parts by weight of an impact-strength improving agent; and

(C) from 0.1 to 5 parts by weight of carbon black.

4,628,071

EMULSION COPOLYMERIZATION PROCESS

Lee W. Morgan, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 584,662, Aug. 21, 1984, abandoned. This application Aug. 16, 1985, Ser. No. 752,878

Int. Cl.[4] C08F *2/22, 220/06*

U.S. Cl. 524—832 **7 Claims**

1. An aqueous emulsion polymerization process for preparing homogeneous, low molecular weight alkali soluble polymer from a water insoluble vinylic monomer and acrylic acid which comprises:

(a) forming an aqueous precharge consisting essentially of sufficient acrylic acid to inhibit formation of homopolymers of said water insoluble vinylic monomer and to promote formation of a homogeneous copolymer of said water insoluble vinylic monomer and acrylic acid, said precharge being initiator free;

(b) adding a comonomers charge of said water insoluble vinylic monomer and acrylic acid to said acrylic acid precharge in the presence of an initiator and a chain transfer agent, wherein the weight ratio of said comonomers in said charge corresponds to a preselected ratio of said comonomers in said alkali soluble polymer and wherein the addition rate of said comonomers charge is no greater than the polymerization rate for said comonomers at a steady state condition; and wherein (1) the polymerization reaction is starved of water insoluble monomer and (2) the initiator is added to the emulsion polymerization reaction mixture immediately preceding and/or simultaneously with the comonomers charge; and

(c) maintaiing a sufficient solids concentration during said polymerization reaction to reduce the tendency of acrylic acid to partition into the aqueous phase.

4,628,072

MODIFIED BLOCK COPOLYMER COMPOSITION

Toshinori Shiraki, Yamato; Fusakazu Hayano, Chigasaki, and Hideo Morita, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP82/00316, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO83/00492, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 13, 1982, Ser. No. 432,923

Claims priority, application Japan, Aug. 13, 1981, 56-125882; Aug. 24, 1981, 56-131650

Int. Cl.[4] C08L *51/00, 53/00, 53/02*

U.S. Cl. 525—57 18 Claims

1. A modified block copolymer composition comprising:

(a) at least one thermoplastic polymer selected from the group consisting of polar thermoplastic polymers each containing at least one polar functional group, polyoxymethylenes, polycarbonates, modified polycarbonates, polysulfones, modified polysulfones, nitrile polymers, polyphenylene ethers, modified polyphenylene ethers, polyarylene sulfides and modified polyarylene sulfides and

(b) at least one modified block polymer which comprises a base block copolymer of at least one monovinyl substituted aromatic hydrocarbon polymer block A and at least one olefin compound polymer block B having an ethylenic unsaturation degree not exceeding 20%, said base block copolymer having at least one molecular unit grafted thereto, said at least one molecular unit containing at least one member selected from a carboxylic acid group and groups derived therefrom, said monovinyl substituted aromatic hydrocarbon being contained in said base block copolymer in an amount of over 60% by weight up to 95% inclusive by weight based on said base block copolymer, said at least one thermoplastic polymer (a) being present in a weight ratio of 90:10 to 5:95 relative to said at least one modified block copolymer (b),

said polar thermoplastic polymers excluding said modified block copolymer (b).

4,628,073

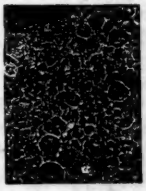
SOFT, RUBBERY, MULTIPHASE MATRIX MATERIAL AND METHODS FOR ITS PRODUCTION

W. Keith Fisher, New Britain, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 3, 1984, Ser. No. 657,168

Int. Cl.[4] C08L *51/00*

U.S. Cl. 525—70 36 Claims



1. A soft, rubbery composition of matter, comprising:

(a) an elastomer selected from the group consisting of natural rubbers, synthetic organic rubbers, gutta percha, polybutadiene, polyisoprene, styrene-butadiene rubber, multiply unsaturated rubber, ethylene propylene diene monomer rubber, conjugated diene-butyl rubber, and blends or admixture thereof, where the elastomer has a determinable fluxing temperature and where the viscosity of said elastomer is sufficiently reduced at said fluxing temperature for incorporating polymer particles therein; and

(b) a cross-linkable polymer selected from the group consisting of cross-linkable organic hompolymers, copolymers, graft copolymers and blends thereof and having an average viscosity molecular weight between 50,000 and 300,000, said polymer existing an discrete 0.3 to 70 micron particles distributed within said elastomer and said polymer having a softening temperature in excess of said fluxing temperature.

4,628,074

POLYCARBONATE COMPOSITIONS

Omar M. Boutni, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Nov. 14, 1985, Ser. No. 797,999

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—146 19 Claims

1. Resinous polycarbonate composition exhibiting improved impact strength consisting essentially of, in physical admixture:

(i) a blend consisting essentially of

(a) at least one aromatic polycarbonate resin, and

(b) at least one copolyester resin containing the reaction products of (A) at least one polyol selected from 1,4-cyclohexanedimethanol or a mixture of 1,4-cyclohexanedimathanol and ethylene glycol, and (B) at least one aromatic dicarboxylic acid or its ester forming reactive derivative selected from isophthalic acid, terephthalic acid, or mixtures thereof; and

(ii) an amount at least effective to improve the impact strength of said blend of at least one olefin diene terpolymer.

4,628,075

ACID HALIDE FUNCTIONAL MATERIALS

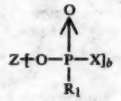
James D. Gabbert, St. Louis; Albert Y. Garner, Manchester, and Ross M. Hedrick, St. Louis, all of Mo., assignors to DSM RIM Nylon VOF, Netherlands

Continuation of Ser. No. 467,622, Feb. 18, 1983, abandoned, which is a continuation-in-part of Ser. No. 374,851, May 4, 1982, abandoned, which is a continuation of Ser. No. 274,131, Jun. 16, 1981, abandoned. This application Jul. 3, 1985, Ser. No. 752,261

Int. Cl.[4] C08F *8/40, 8/30, 8/18*

U.S. Cl. 525—403 28 Claims

1. Acid halide functional material of the formula:



wherein:

X is a halogen;

b is an integer greater than 2;

R_1 is an alkyl, aryl, aralkyl, halogen, alkyloxy, aryloxy or aralkyloxy group; and

Z is a segment of: (1) a polyether provided said polyether is not solely polyarylene polyether; (2) a polyester containing polyether or polymeric hydrocarbon segments; (3) a polysiloxane; or (4) combinations thereof.

4,628,076

CURABLE COATING VEHICLE BASED UPON AMINOALKYLOXY SILANES AND ORGANIC ISOCYANATES

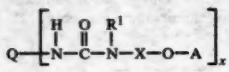
Wen-Hsuan Chang, and David T. McKeough, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 17, 1984, Ser. No. 682,644

Int. Cl.[4] C08F *20/00*

U.S. Cl. 525—440 24 Claims

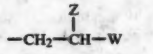
1. An ungelled resin comprising a compound corresponding to the formula,



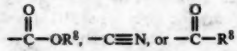
wherein

Q represents the residue of an organic isocyanate having an average isocyanate functionality of at least 1,

R^1 independently represents H, a C_1 to C_{10} alkyl radical, a C_1–C_{10} hydroxyalkyl radical or a radical corresponding to the formula



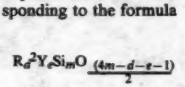
wherein Z represents H or C_1 to C_4 alkyl, and W represents



in which R^8 represents C_1 to C_8 alkyl,

X represents a divalent radical containing at least 2 carbon atoms,

A represents a monovalent silicon-containing group corresponding to the formula



wherein

R^2 independently represents hydrogen, a C_1 to C_{10} alkyl group, a C_4 to C_{10} cycloalkyl group, a C_6 to C_{10} aryl group, or a monovalent aminoalkyl group, that is attached directly to Si,

Y represents a hydrolyzable group that is attached directly to Si,

m is an integer ranging from 1 to 5,

e is a positive integer wherein $1 \leqq e \leqq 11$, d is zero or a positive integer wherein $0 \leqq d \leqq 10$, and $3 \leqq d+e \leqq 11$, and

wherein x is a positive number which is equal to or less than the average isocyanate functionality of said organic isocyanate.

4,628,077

PREPARATION OF POLYAMIDE WITH CATALYST COMPRISING TRANSITION METAL ATTACHED TO A LIGAND WHICH CONTAINS ELECTRON WITHDRAWING GROUPS

Michael J. Desmond, Cleveland Heights; Raymond J. Weinert, Jr., Garfield Hts.; Lawrence E. Ball, Akron, and Kenneth C. Benton, Macedonia, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 562,270, Dec. 16, 1983, abandoned. This application Nov. 1, 1985, Ser. No. 794,584

Int. Cl.[4] C08G *69/00*

U.S. Cl. 526—90 **25 Claims**

1. A process for producing a nylon type polyamide, containing a plurality of

amide groups as integral parts of the main polymer chain, comprising contacting at a temperature sufficient to cause polymerization, at least one polyamide forming reactant with a transition metal complex catalyst, wherein the catalyst comprises at least one transition metal attached to a ligand containing electron withdrawing substituents wherein the electron withdrawing substituents are selected from the group consisting of —F, —Cl, —Br, —I, $—CF_3$,

—CN, $—NH_3^+$, $—NO_2$, and $—NR_3^+$ where R is an alkyl or an aryl radical.

4,628,078

ACRYLAMIDE-DIALKYLAMINOACRYLATE-DIALKYLAMINOMETHACRYLATE CATIONIC POLYELECTROLYTES AND THEIR PRODUCTION

Rodney Glover, Heckmondwike, and Martin R. Brown, Liversedge, both of United Kingdom, assignors to Allied Colloids Ltd., England

Filed Jun. 12, 1985, Ser. No. 743,759

Claims priority, application United Kingdom, Jun. 12, 1984, 8414950

Int. Cl.[4] C08F *20/60, 120/60, 220/60*

U.S. Cl. 526—303.1 **12 Claims**

1. A high molecular weight cationic polyelectrolyte formed from acrylamide and cationic monomer characterised in that the polymer is a terpolymer of (a) dialkylaminoalkyl acrylate acid addition or quaternary ammonium salt with (b) dialkylaminoalkyl methacrylate acid addition or quaternary ammonium salt and (c) acrylamide, in which the molar ratio a:b is about 88:15 to about 5:95 and in which the molar amount of acrylamide based on the total molar amount of (A), (B) and (C) is 20 to 99%.

4,628,079

POLYAMIDE IMIDES PRODUCED FROM EITHER LACTAMS OR POLYAMIDES WITH ISOCYANATES OR ANHYDRIDES IN WHICH PRODUCTS ARE PRECIPITATED WITH A NON-SOLVENT

Wilfried Zecher, Leverkusen; Rolf Dhein, Krefeld, and Klaus Reinking, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 644,515, Aug. 28, 1984, Pat. No. 4,549,006. This application Jun. 20, 1985, Ser. No. 746,715

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3332031

Int. Cl.[4] C08G *18/82*

U.S. Cl. 528—49 **10 Claims**

1. A thermoplastic material which comprises polyamide imides produced in a solvent from polyisocyanates, polycarboxylic acid anhydrides and lactams or polyamides, precipitated with a non-solvent and then granulated.

4,628,080

CURE RATE CONTROL IN EPOXY RESIN COMPOSITIONS

Larry S. Corley, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1985, Ser. No. 782,749

Int. Cl.[4] C08G *59/68, 59/72*

U.S. Cl. 528—88 **12 Claims**

1. A composition comprising:

(a) an epoxy resin;

(b) a cationic curing agent for the epoxy resin; and

(c) from about 0.01 to about 10 weight percent, based on the weight of the epoxy resin, of a surfactant.

4,628,081

POLYCARBONATE EXHIBITING IMPROVED IMPACT PROPERTIES

Victor Mark, deceased, late of Evansville, Ind., by Carol M. Mark, Ester H. Mark, legal representatives, and Edward N. Peters, Lenox, Mass., assignors to General Electric Company, Mt. Vernon, Ind.

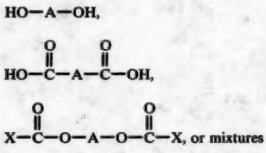
Filed Nov. 12, 1985, Ser. No. 797,254
Int. Cl.[4] C08G 63/62
U.S. Cl. 528—176 27 Claims

1. A thermoplastic aromatic carbonate resin comprised of the polymerized reaction products of:

(i) at least one dihydric phenol;

(ii) a carbonate precursor; and

(iii) an amount at least effective to improve the impact properties of said resin of at least one polymer selected from polymers represented by the formulae



thereof;

wherein A is selected from the divalent residue of at least one polymerized and substantially fully hydrogenated alkadiene and has a weight average molecular weight of at least about 600 and up to about 20,000, and X is independently selected from halogen radicals.

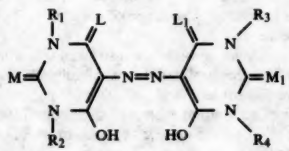
4,628,082

DERIVATIVES OF AZOBARBITURIC ACID OR SALTS OR COMPLEXES THEREOF

Manfred Lorenz, Cologne, and Karl H. Schündehütte, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 670,433, Nov. 9, 1984, abandoned, which is a continuation of Ser. No. 408,346, Aug. 16, 1982, abandoned. This application May 14, 1985, Ser. No. 734,364
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981, 3134725; Apr. 29, 1982, 3215875
Int. Cl.[4] C09B 29/036, 29/52, 45/14, 45/22
U.S. Cl. 534—707 13 Claims

1. A compound which, in the form of its free acid corresponds in one of its tautomeric structures to the formula



in which

L=O or NR_7,

L_1=O or NR_7,

with the proviso that only one of L and L_1 can at the same time be NR_7,

one of M or M_1=O and the other is O, NR_7, CN or

R_6 represents hydrogen, alkyl, cycloalkyl, aryl or aralkyl and

R_7 represents hydrogen, cyano, alkyl cycloalkyl, aryl, aralkyl or acyl which acyl is (C_1–C_6-alkyl)carbonyl, phenylcarbonyl, C_1–C_6-alkylsulphonyl, phenylsulphonyl, carbamoyl, carbamoyl substituted by C_1–C_6-alkyl, phenyl or naphtyl, sulphamoyl, sulphamoyl substituted by C_1–C_6-alkyl, pheny or naphthyl, said alkyl radical being unsubstituted or substituted by halogen, —OH, —CN, $—NH_2$ or C_1–C_6-alkoxy, and said phenyl and naphthyl radicals being unsubstituted or substituted by halogen, —OH, C_1–C_6-alkyl, C_1–C_6-alkoxy, $—NH_2$, NO_2 or CN,

R_1, R_2, R_3 and R_4 represent hydrogen, alkyl, cycloalkyl, aryl or aralkyl or salts or complexes of mono-, di-, tri and tetra-anions of said compound, said salts and complexes containing a metal selected from the group consisting of Li, Cs, Mg, Cd, Co, Al, Cr, Sn, Na K, Ca, Sr, Ba, Zn, Fe, Ni, Cu, Mn and Pb with the exception of azobarbituric acid and its salts and complexes.

4,628,083

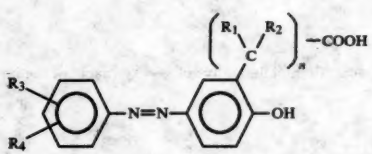
2-HYDROXY-5-(ARYLAZO)-BENZENE ALKANOIC ACIDS

Karl H. Agback, Upsala, Sweden, assignor to Pharmacia AB, Uppsala, Sweden

Continuation of Ser. No. 542,508, Oct. 17, 1983, abandoned.
This application Jan. 18, 1985, Ser. No. 692,417
Int. Cl.[4] A61K 31/655; C07C 107/06; C09B 29/14, 43/136
U.S. Cl. 534—798 6 Claims

1. An arylazo compound of the general formula

I



wherein R_1 and R_2 independently of each other represent hydrogen or C_{1-3} alkyl, R_3 represents hydrogen, halogen, C_{1-3} alkyl, C_{1-3} alkoxy, carboxy, C_{1-3} alkoxycarbonyl, C_{1-3} akylcarbonyl or a group X—NH—SO_2—, wherein X represents a heterocyclic ring, R_4 represents hydrogen, halogen or C_{1-3} alkyl, and n is the integer 1 or 2, the two groups

being the same or different when n is 2, or a lactone or a salt thereof.

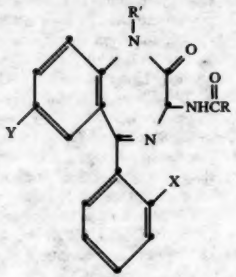
4,628,084

PROCESS FOR 3-ACYLAMINO BENZODIAZEPINES

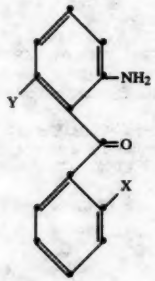
Mark G. Bock, Hatfield; Daniel F. Veber, Ambler, and Robert M. DiPardo, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 2, 1986, Ser. No. 815,620
Int. Cl.[4] C07D 243/24
U.S. Cl. 540—509 5 Claims

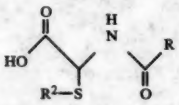
1. A process for the preparation of 3-acylamino benzodiazepines of the formula:



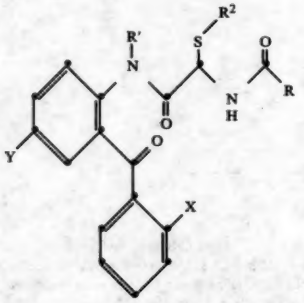
wherein X and Y are hydrogen or halogen, which comprises reacting an o-aminobenzophenone of the formula:



with an amidothiol derivative of glyoxylic acid of the formula:



to form an N-acylbenzophenone of the formula:

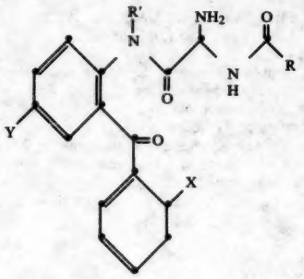


wherein:

R is loweralkyl of from 1–6 carbon atoms, aryl such as phenyl or halophenyl, aralkyl, alkyloxy or aralkyloxy, indolyl or substituted indolyl;

R′ is hydrogen, loweralkyl of from 1–6 carbon atoms, carboxymethyl, or carbalkoxymethyl wherein the alkoxy groups contain from 1–4 carbon atoms;

R^2 is loweralkyl, aralkyl, or aryl; treating said N-acylbenzophenone with ammonia in the presence of silver or mercury salts to form a compound of the formula:



and heating said product.

4,628,085

USE OF SILICA CATALYST FOR SELECTIVE PRODUCTION OF LACTAMS

Frank Mares, Whippany; Reginald T-H. Tang, Warren; James E. Galle, Madison, and Rose M. Federici, Princeton, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 3, 1985, Ser. No. 771,854

Int. Cl.[4] C07D *201/08, 223/10*

U.S. Cl. 540—539 **27 Claims**

1. A process for selective preparation of lactams which comprises contacting, in the vapor phase, an aliphatic or aromatic aminonitrile having the formula $HR_1N—D—CN$, wherein D is a divalent organic moiety and wherein R_1 is $(C_1–C_4)$alkyl or hydrogen, with an effective amount of a silica catalyst, in the form of substantially spherical beads having a BET surface area greater than about 250 m^2/g and an average pore diameter less than about 20 nanometers at a temperature in the range of about 200° to about 400° C. and at a hydrogen or inert gas pressure in the range of about 0 to about 500 kPa, in the presence of:

(a) ammonia in an amount equal to from 0 to about 50 mole percent of the molar amount of aliphatic or aromatic aminonitrile present; and

(b) water in an amount from at least about 1.0 to about 50 times the molar amount of aliphatic or aromatic aminonitrile present

for a time sufficient to produce the corresponding lactam.

9. A process for the selective conversion of ϵ-aminocapronitrile into ϵ-caprolactam which comprises contacting, in the vapor phase, ϵ-aminocapronitrile, in the presence of adiponitrile, with an effective amount of a silica catalyst at a temperature in the range of about 200° to about 400° C. and at a hydrogen or inert gas pressure in the range of about 0 to about 500 kPa in the presence of:

(a) ammonia in an amount equal to about 0 to about 50 mole percent of the ϵ-aminocapronitrile present; and

(b) water in an amount from at least about 1.0 to about 50 times the molar amount of the aminocapronitrile present

for a time sufficient to produce ϵ-caprolactam and to recover substantially all the adiponitrile initially present.

4,628,086

PREPARATION OF DIOXAZINE COMPOUNDS

Günter Franke, Leichlingen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

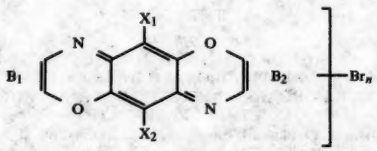
Filed Dec. 2, 1985, Ser. No. 803,457

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444888

Int. Cl.[4] C07D *265/34, 279/14*

U.S. Cl. 544—31 13 Claims

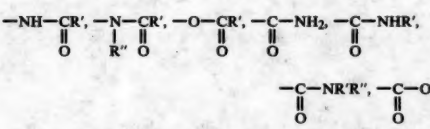
1. A process for the preparation of a dioxazine compound of the formula



in which

B_1 and B_2 designate a ring system with 1, 2, 3 or 4 carbocyclic and/or heterocyclic rings which can be substituted, and

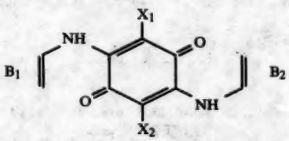
X_1 and X_2 designate hydrogen, halogen, —R′, —OR′, —NHR′, —NR′R″,



R′ and R″ representing alkyl, cycloalkyl, aryl and aralkyl and

n denoting 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11, it being possible for the n bromine atoms, independently of one another, to replace both H atoms of the ring systems B_1 and B_2 or their substituents and H atoms of X_1 and X_2 as well as X_1 and X_2 themselves,

wherein a compound of the formula



is reacted with bromine.

4,628,087

PROCESS FOR THE PREPARATION OF PHARMACOLOGICALLY ACTIVE COMPOUNDS CONTAINING A SULFOXIDE GROUP

Mariano Meneghin, Revine-Lago, Italy, assignor to Zambon S.p.A., Vicenza, Italy

Filed May 7, 1984, Ser. No. 607,562

Claims priority, application Italy, May 13, 1983, 21073 A/83

Int. Cl.[4] C07D *279/24;* C07C *147/14*

U.S. Cl. 544—41 8 Claims

1. A process for the preparation selectively of compounds containing a sulfoxide group while substantially avoiding undesired sulfones consisting of oxidizing the corresponding thioethers with an alkali metal hypochlorite in an alkaline medium having a pH higher than 10 and at a temperature between 0° and 40° C.

4,628,088

PREPARATION OF SUBSTITUTED PYRIDAZINES

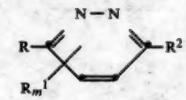
Jack G. Samaritoni, Knightstown, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 17, 1984, Ser. No. 631,654

Int. Cl.[4] C07D *237/12*

U.S. Cl. 544—224 7 Claims

1. A process for preparing a substituted pyridazine of the formula (I)



(I)

which comprises reacting a less substituted pyridazine of the formula (A)

(A)

with a carboxylic acid of the formula R^1COOH in the presence of peroxydisulfate ion, a catalytic amount of silver ion, and mineral acid, whose anion will not cause precipitation of the corresponding silver salt, all in an aqueous solvent system at a temperature from about 40° to about 80° C.; wherein

R is chloride, C_1–C_4 alkyl, or phenyl;

R^1 is C_3–C_6 secondary or tertiary alkyl;

R^2 is halo; and

m is 1.

4,628,089

PYRIDO(2,3-D)PYRIMIDINES

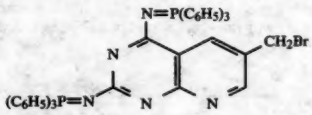
Carroll G. Temple; John A. Montgomery, and Robert D. Elliott, all of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Division of Ser. No. 673,283, Nov. 20, 1984, Pat. No. 4,536,575, which is a division of Ser. No. 413,501, Aug. 31, 1982, Pat. No. 4,526,964, which is a continuation-in-part of Ser. No. 338,542, Jan. 11, 1982, Pat. No. 4,431,805, which is a continuation-in-part of Ser. No. 305,907, Sep. 25, 1981, abandoned. This application Mar. 15, 1985, Ser. No. 712,116

Int. Cl.[4] C07D *487/02*

U.S. Cl. 544—244 1 Claim

1. A dimethylacetamide solution of a compound having the structure:



4,628,090

FLUORINE-CONTAINING ANTIFOLATES INCAPABLE OF POLYGLUTANAYTE FORMATION RELATED COMPOUNDS

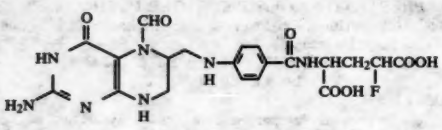
James K. Coward, Troy, N.Y., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Continuation-in-part of Ser. No. 642,808, Aug. 21, 1984, Pat. No. 4,584,375. This application Aug. 19, 1985, Ser. No. 767,122

Int. Cl.[4] C07D *475/08*

U.S. Cl. 544—258 2 Claims

1. A compound having the formula:



4,628,091
PROCESS FOR PRODUCING DIANTHRAQUINONE-N,N'-DIHYDRAZINE AND ITS CHLORINATION PRODUCT

Kimitoshi Kato; Hiroshi Aiga; Tamio Mikoda, and Tunehiro Sakai, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,398
Claims priority, application Japan, Jun. 16, 1983, 58-106789; Feb. 27, 1984, 59-34405
Int. Cl.[4] C07D 241/46
U.S. Cl. 544—339 4 Claims

1. A process for producing dianthraquinone-N,N'dihydrazine or its chlorination product, which process comprises condensing 1-amino-anthraquinone at an elevated temperature in the presence of 1,3-dimethyl-2-imidazolidinone using an oxidizing agent and an alkaline condensing agent, from 1.0 to 10 parts by weight of the 1,3-dimethyl-2-imidazolidinone and from 0.1 to 10 parts by weight of the alkaline condensing agent being used per part by weight of the 1-aminoanthraquinone, and subjecting the resultant condensation product to purification.

4,628,092
TRIETHYLENEDIAMINE CONTAINING ACETYLENIC ALCOHOLS AS FLOW AIDS

Akio Takahashi, Macungie, and Robert G. Petrella, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 21, 1985, Ser. No. 747,620
Int. Cl.[4] C07D 487/08; B01J 2/30
U.S. Cl. 544—351 16 Claims

1. A method for improving the flowability of stored triethylenediamine which comprises mixing with the triethylenediamine a flow improving amount of a C_5–C_{28} acetylenic alcohol.

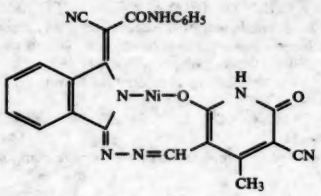
9. A composition consisting essentially of triethylenediamine admixed with a flow promoting amount of a C_5–C_{28} acetylenic alcohol.

4,628,093
RED NICKEL AZINE PIGMENT

Rütger Neeff; Meinhard Rolf, and Walter Müller, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 23, 1984, Ser. No. 663,781
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1983, 3338622
Int. Cl.[4] C07D 401/12; C08K 5/34; C09B 57/04
U.S. Cl. 546—6 3 Claims

1. Red pigment which, in one of its tautomeric forms, corresponds to the formula



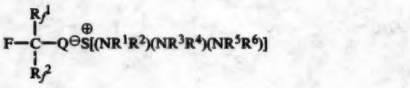
(I)

4,628,094
TRIS(DISUBSTITUTED AMINO)SULFONIUM PERFLUOROALKOXIDES AND PERFLUOROALKYLMERCAPTIDES AND PROCESS FOR THEIR PREPARATION

William B. Farnham, Wilmington, Del., and William J. Middleton, Chadds Ford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 8, 1984, Ser. No. 618,736
Int. Cl.[4] C07D 145/02, 207/48, 211/96
U.S. Cl. 546—186 22 Claims

1. Tris(disubstituted amino)sulfonium perfluoroalkoxide and -perfluoroalkylmercaptide of the formula



wherein

R^1 through R^6, each selected independently, are C_{1-20} alkyl, each having at least 2 alpha hydrogen atoms, or any or all of the pairs R^1 and R^2, R^3 and R^4, and R^5 and R^6, each pair selected independently, are $(CH_2)_4$ or $(CH_2)_2CHY(CH_2)_2$, wherein Y is hydrogen or methyl;

R_f^1 and R_f^2, each selected independently, are F, C_{1-12} perfluoroalkyl, C_{2-12} perfluoro(alkoxyalkyl), C_{3-12} perfluoro(alkoxyalkoxyalkyl), C_{4-12} perfluorocycloalkyl, or XR_f^3 wherein R_f^3 is C_{1-12} perfluoroalkylene or C_{4-12} perfluorocycloalkylene and X is Cl, Br or I, or R_f^1 and R_f^2 taken together are $(CF_2)_n$ wherein n is an integer and is 2 to 6; and

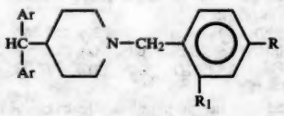
Q is O or S.

4,628,095
SUBSTITUTED N-BENZYL-4-(BENZHYDRYL) PIPERIDINES

Kurt J. Rorig, Glenview; Stevan W. Djuric, Evanston; Kerry W. Fowler, Chicago, and Chi-Dean Liang, Glenview, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Jun. 5, 1985, Ser. No. 741,648
Int. Cl.[4] C07D 211/10, 211/08
U.S. Cl. 546—234 7 Claims

1. A compound of the formula



and the pharmaceutically acceptable salts thereof wherein Ar are the same or different and represent phenyl or halogen substituted phenyl; R is di (lower alkyl) amino; and R_1 is carboxy, lower alkoxy-carbonyl or lower alkylaminocarbonyl.

4,628,096

PREPARATION OF 2-HALO-5-METHYLPYRIDINES FROM 4-METHYL-4-PENTENE DERIVATIVES

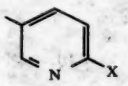
Richard V. Nelson, Wilmington, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 496,680, May 20, 1983, Pat. No. 4,504,664. This application Dec. 20, 1984, Ser. No. 684,149

Int. Cl.[4] C07D *213/61*

U.S. Cl. 546—250 19 Claims

1. A method for the preparation of a 2-halo-5-methylpyridine of the following formula (I):



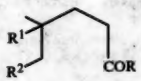
(I)

wherein X is a halogen atom, said method comprising the steps of:

(a) reacting a 4-methyl-4-pentene derivative of the following formula (II):

(II)

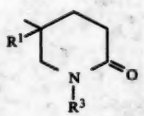
wherein R is a halo, aryloxy or alkoxy group with a halohydrination, haloalkanoyloxylation, halogenation or oxidation agent to produce a pentane derivative of the following formula (III):



(III)

wherein R^1 and R^2 are (i) independently alkanoyloxy, hydroxy or halogen groups or (ii) are joined together to form a 3-membered heterocyclic ring;

(b) reacting the pentane derivative of formula (III) with an amine to produce a pyridone of the following formula (IV):



(IV)

wherein R^3 is alkoxy, alkanoyloxy or hydroxy; and

(c) reacting the pyridone of formula (IV) with a halogenation agent to produce the 2-halo-5-methylpyridine of formula (I).

4,628,097

PROCESS FOR THE PREPARATION OF 2-AMINO-ALKYLPYRIDINES

Helmut Le Blanc; Lothar Puppe, both of Burscheid, and Karlfried Wedemeyer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

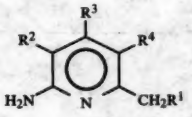
Filed Aug. 30, 1984, Ser. No. 645,947

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332687

Int. Cl.[4] C07D *213/73, 213/09*

U.S. Cl. 546—251 3 Claims

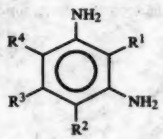
1. A process for the preparation of a 2-amino-alkylpyridine of the formula



wherein

R^1 to R^4 are identical or different and represent hydrogen, C_1 to C_6 alkyl, C_3 to C_{12} cycloalkyl, aralkyl with 7 to 12 carbon atoms or unsubstituted aryl or aryl substituted by alkyl with 6 to 12 carbon atoms,

which comprises heating a reaction mixture consisting essentially of a 1,3-diaminobenzene of the formula



wherein

R^1 to R^4 have the above-mentioned meanings

in the presence of ammonia and a catalyst selected from the group consisting of zeolites and gamma-Al_2O_3, the process being carried out at a temperature of 250° to 500° C. and at a pressure of 10 to 250 bar.

4,628,098

2-[2-PYRIDYLMETHYLTHIO-(SULFINYL)]BENZIMIDAZOLES

Akira Nohara, and Yoshitaka Maki, both of Kyoto, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

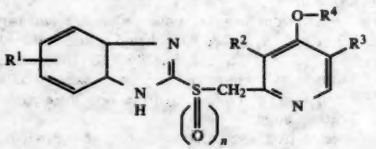
Filed Jul. 29, 1985, Ser. No. 760,568

Claims priority, application Japan, Aug. 16, 1984, 59-171069

Int. Cl.[4] C07D *401/12*

U.S. Cl. 546—271 36 Claims

1. A compound of the formula



wherein R^1 is hydrogen, methoxy or trifluoromethyl, R^2 and R^3 are independently hydrogen or methyl, R^4 is a C_{2-5} fluorinated alkyl and n denotes 0 or 1, and a pharmacologically acceptable salt thereof.

4,628,099

TRIFLUOROMETHYL PYRIDINYLOXYPHENOXY PROPANOIC ACID CHLORIDES

Howard Johnston, Walnut Creek, and Lillian H. Troxell, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 918,550, Jun. 23, 1978, which is a continuation-in-part of Ser. No. 817,943, Jul. 22, 1977, abandoned. This application Apr. 8, 1985, Ser. No. 720,844

Int. Cl.[4] C07D *213/64*

U.S. Cl. 546—302 2 Claims

1. The acid chloride of 2-(4-((3-chloro-5-(trifluoromethyl)-2-pyridinyl)oxy)phenoxy)propanoic acid.

4,628,100

INTERMEDIATES FOR THE PREPARATION OF ARYL SUBSTITUTED PYRIDO[1,4]BENZODIAZEPINES

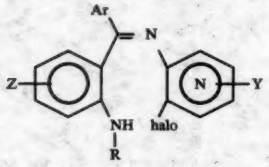
Young S. Lo, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 597,413, Apr. 6, 1984, Pat. No. 4,560,510. This application Jun. 26, 1985, Ser. No. 748,790

Int. Cl.[4] C07D *213/75, 471/04*

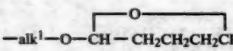
U.S. Cl. 546—304 3 Claims

1. A compound selected from the group having the formula:



wherein;

R is selected from the group consisting of hydrogen, loweralkyl, —alk[1]—NR^1R^2, —alk[1]—N=CH—OC_2H_5 or



R^1 and R^2 are selected from the group consisting of loweralkyl, —C(O)—O—loweralkyl or R^1 and R^2 taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from the group consisting of 1-piperidinyl, 1-phthalimido, 1-pyrrolidinyl, 4-morpholino, 1-piperazinyl and 4-substituted —1—piperazinyl substituted in the 4-position by loweralkyl or an alkoxy-carbonyl blocking group;

Ar is selected from the group consisting of 2, 3, and 4-pyridinyl, 2 or 3-thienyl, phenyl or phenyl substituted by 1 to 3 radicals selected from halo, loweralkyl, loweralkoxy, trifluoromethyl or nitro and may be the same or different;

alk[1] is a straight or branched hydrocarbon chain containing 1–8 carbon atoms;

Z is selected from the group consisting of hydrogen, halogen, loweralkyl, loweralkoxy, hydroxy or nitro;

Y is selected from the group consisting of hydrogen or 1–2 radicals selected from from loweralkyl, loweralkoxy or hydroxy and may be the same or different,

or the acid addition salts thereof.

4,628,101

COMPOUNDS HAVING A ANTIDOTE ACTIVITY FOR THE PROTECTION OF CULTIVATIONS OF AGRARIAN INTEREST FROM THE ACTION OF NONSELECTIVE HERBICIDES

Giovanni Camaggi, Lodi; Franco Gozzo, San Donato Milanese; Ernesto Signorini, Mainate, and Ottorino Palla, Crema, all of Italy, assignors to Montedison S.p.A., Milan, Italy

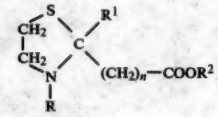
Continuation of Ser. No. 528,169, Aug. 31, 1983, abandoned. This application Feb. 28, 1986, Ser. No. 834,773

Claims priority, application Italy, Sep. 1, 1982, 23092 A/82; Jul. 12, 1983, 22015 A/83

Int. Cl.[4] C07D *277/04, 277/06*

U.S. Cl. 548—200 8 Claims

1. A compound of formula:



wherein:

R represents the group

in which R^3 is a C_1–C_3 haloalkyl containing from 1 to 3 halogen atoms or phenyl;

R^1 represents a hydrogen atom, methyl or phenyl;

R^2 represents a C_1–C_8 alkyl, C_5–C_6 cycloalkyl, cyclohexyl methyl, phenyl, benzyl, allyl or propargyl optionally substituted with halogen atoms;

n is zero or one;

provided that, when contemporaneously R is a haloacetyl group, R^1 is hydrogen, and n is zero, R^2 is different from a C_1–C_4 alkyl.

4,628,102

NOVEL MONOMERS CONTAINING BICYCLIC AMIDE ACETAL AND EPOXY FUNCTIONAL GROUPS

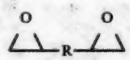
Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 16, 1985, Ser. No. 766,361

Int. Cl.[4] C07D *498/00*

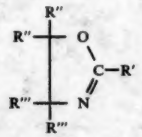
U.S. Cl. 548—218 14 Claims

1. The process for preparing a monomer which contains both bicyclic amide acetal and epoxy groups comprising reacting a compound of Formula I



I

with A compound of Formula II



II

wherein R represents a linear or cyclic alkylene group having from 1 to 30 carbon atoms, an arylene group having from 6 to 12 carbon atoms, an alkylene ether group having from 1 to 20 carbon atoms, or an arylene ether group having from 6 to 12

carbon atoms; R' represents an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 12 carbon atoms L or an alkaryl group having from 7 to 20 carbon atoms, and R'' and R''' independently represent hydrolgen, an alkyl group having from 1 to 10 carbon atoms or an aryl group having from 6 to 12 carbon atoms.

4,628,103

PROCESS FOR THE PREPARATION OF 3-AMINO-1,2,4-TRIAZOLE

Michel Alicot, La Barthe de Neste, France, assignor to Atochem, France

Filed Jun. 19, 1985, Ser. No. 746,287
Claims priority, application France, Jun. 20, 1984, 84 09663
Int. Cl.[4] C07D *249/14*
U.S. Cl. 548—266 10 Claims

1. A process for the preparation of 3-amino-1,2,4-triazole which comprises simultaneously adding hydrazine hydrate and formic acid to cyanamide at a temperature of from 0° to 10° C. and a pH (measured at 4° C.) of 6 to 7; bringing the mixture so formed to a temperature of 60° to 100° C. at a pH (measured at 20° C.) of 7 to 8 and maintaining the mixture at such temperature and pH, until substantially no hydrazine hydrate remains, to obtain aminoguanidine formate; evaporating liquid from the aminoguanidine formate solution at a temperature of from 30° to 60° C. to obtain a suspension having a solids content of from 100 to 700 g/L; filtering the suspension obtained to remove the solids from suspension in the mother liquor; washing the solids so obtained with a wash medium to produce a dicyandiamide content of less than 0.25 percent by weight, based on the dry formate; withdrawing the wash medium from the solids; and heating the washed solids so obtained to a temperature of from 110° to 200° C. to cyclize the formate and produce the aminotriazole.

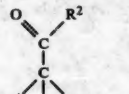
4,628,104

IMIDAZOLE KETONE DERIVATIVES

Jonathan P. Dickens, and William R. McKay, both of High Wycombe, United Kingdom, assignors to G. D. Searle & Co., Skokie, Ill.

Filed Apr. 8, 1985, Ser. No. 720,917
Int. Cl.[4] C07D *233/54, 249/08, 233/66, 401/00*
U.S. Cl. 548—341 2 Claims

1. A compound of the formula:



wherein

R^1 is phenyl or C_1–C_4 alkylphenyl;

R^2 is dihalophenyl; and

A is imidazol-1-yl 1,2,4-triazol-1-yl or substituted imidazol-1-yl wherein the substituent is one or more groups selected from class consisting of C_1–C_4 alkylthio and carboxy(C_2–C_4 alkenyl);

and pharmaceutically acceptable acid addition salts thereof.

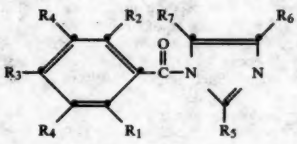
4,628,105

NOVEL IMIDAZOLIDES AND THEIR USE AS CURING AGENTS FOR POLYEPOXIDE COMPOUNDS

Rolf Schmid, Schwarzenburg; Helmut Zondler, Bottmingen; Michael Fischer, Tafers, and Werner Stauffer, Fribourg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 602,260, Apr. 20, 1984, Pat. No. 4,587,311.
This application Jan. 29, 1986, Ser. No. 823,695
Claims priority, application Switzerland, Apr. 29, 1983, 2316/83
Int. Cl.[4] C07D *233/60*
U.S. Cl. 548—341 5 Claims

1. An imidazolide of the formula I



(I)

wherein

R_1 is methyl, ethyl or isopropyl,

R_2, R_3 and R_4 independently of one another are each hydrogen, methyl, ethyl or isopropyl, with the proviso that R_2 is hydrogen only when R_1 is isopropyl,

R_5, R_6 and R_7 independently of one another are each hydrogen, methyl, ethyl or isopropyl, or phenyl which is unsubstituted or substituted by methyl or ethyl groups, with the proviso that at least one of the symbols R_5, R_6 and R_7 is phenyl which is unsubstituted or substituted according to definition.

4,628,106

PROCESS FOR THE PREPARATION OF 2-HYDROXY-(9H)-CARBAZOLE

Otto E. Schweikert, Kelkheim; Walter Reimann, Hofheim am Taunus; Werner Wykypiel, Rodgau, and Karl E. Mack, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,485
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410232
Int. Cl.[4] C07D *209/88*
U.S. Cl. 548—440 1 Claim

1. A process for the preparation of 2-hydroxy-(9H)-carbazole, which comprises catalytically hydrogenating 1,2,3,4-tetrahydro-7-hydroxy-(9H)-carbazole in an inert organic solvent selected from the group consisting of alcohols, ether alcohols and mixtures thereof.

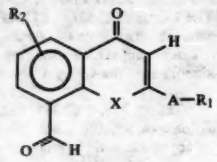
4,628,107

INTERMEDIATE 8-CARBOXALDEHYDE-(-CHROMONE AND -THIOCHROMONE) DERIVATIVES

Siegfried Goldmann; Gerhard Franckowiak, both of Wuppertal; Matthias Schramm, Cologne; Günter Thomas, and Rainer Gross, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 589,436, Mar. 14, 1984, Pat. No. 4,540,789, and a continuation-in-part of Ser. No. 589,615, Mar. 14, 1984, abandoned. This application Jun. 28, 1985, Ser. No. 750,571
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3311004; Mar. 25, 1983, 3311005
Int. Cl.[4] C07D *405/06, 405/12, 409/06, 409/12*
U.S. Cl. 549—23 8 Claims

1. A compound of the formula



in which

R_1 represents hydrogen, a straight-chain, cyclic or branched C_1–C_{10} alkyl radical, a C_1–C_{10} alkyl carboxylate, or a phenyl, 3H-thienyl; 2H-pyridyl, furyl or pyrryl radical which optionally has 1–5 identical or different halogen, C_1–C_{10}-alkyl or C_1–C_{10}-alkoxy substituents,

R_2 represents hydrogen or 1 to 3 halogen atoms, A represents a single bond, a C_1–C_{20} alkylene chain or a C_2–C_{20} alkenylene chain which can optionally be interrupted by oxygen or sulphur, and

X represents oxygen or sulphur.

4,628,108

PRODUCTION OF 2-SUBSTITUTED-1,3-DIOXOLANES FROM 1,3-DIOXOLANE AND FORMALDEHYDE

John R. Sanderson, and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 19, 1984, Ser. No. 683,548

Int. Cl.[4] C07D *317/00*

U.S. Cl. 549—453 **14 Claims**

1. A method for the preparation of 2-hydroxyalkyl-1,3-dioxolanes which comprises reacting 1,3-dioxolane under non-acidic conditions with formaldehyde in the presence of a hydroperoxide and a metal salt.

4,628,109

2-KETOSULFONAMIDES AND PROCESS FOR THEIR PREPARATION

Erwin Schmidt; Dieter Günther, both of Kelkheim, and Klaus-Dieter Kampe, Bad Sodem am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

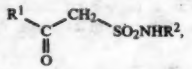
Filed Jun. 27, 1984, Ser. No. 624,938

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1983, 3323510

Int. Cl.[4] C07C *143/74, 143/78*

U.S. Cl. 560—13 **4 Claims**

1. A process for the preparation of 2-ketosulfonamide of the formula I



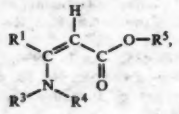
(I)

in which

R^1 is a C_1–C_4 alkyl radical, and

R^2 is a hydrogen atom,

wherein a 3-aminoalk-2-enoic acid ester of the formula II

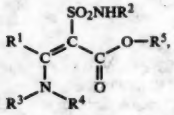


(II)

in which R^1 has the meaning given above, R^3 and R^4 are identical or different and are hydrogen, C_1–C_4 alkyl radicals which may be linked together to form a ring, or C_6–C_{12} aralkyl or C_6–C_{12} aryl radicals having 0 to 2 heteroatoms, and R^5 is a branched or unbranched C_1–C_{18} alkyl radical which may contain heteroatoms, is reacted with an amidosulfonyl halide of the formula III

$$X\text{-}SO_2NH\text{-}R^2 \quad \text{(III)},$$

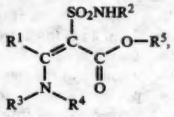
in which R^2 has the abovementioned meaning and X is chlorine, bromine or fluorine, in the presence of at least one equivalent, based on the ester used, of a base, and the resulting 3-amino-2-sulfamoylalk-2-enoic acid ester of the formula IV



(IV)

in which R^1, R^2, R^3, R^4 and R^5 have the abovementioned meanings, is subjected to acid or alkaline saponification and decarboxylation.

4. A process for the preparation of 3-amino-2-sulfamoylalk-2-enoic acid esters of the formula IV



(IV)

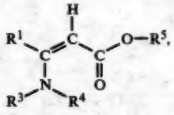
in which

R^1 is a C_1–C_4 alkyl radical, and

R^2 is a hydrogen atom,

R^3 and R^4 are identical or different and are hydrogen, C_1–C_4 alkyl radicals which may be linked together to form a ring, or C_6–C_{12} aralkyl or C_6–C_{12} aryl radicals having 0 to 2 heteroatoms, and R^5 is a branched or unbranched C_1–C_{18} alkyl radical which may contain heteroatoms,

wherein a 3-aminoalk-2-enoic acid ester of the formula II



(II)

in which R^1, R^3, R^4 and R^5 have the abovementioned meanings, is reacted with an amidosulfonyl halide of the formula III

$$X\text{—}SO_2NH\text{—}R^2 \quad \text{(III)},$$

in which R^2 has the abovementioned meaning and X is chlorine, bromine or fluorine, in the presence of at least one equivalent, based on the ester used, of a base.

4,628,110

NOVEL 9-SUBSTITUTED CARBACYCLIN ANALOGS

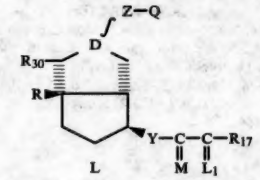
Paul A. Aristoff, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 349,122, Feb. 16, 1982. This application Oct. 30, 1984, Ser. No. 666,404

Int. Cl.[4] C07C *177/00, 57/26*

U.S. Cl. 560—119 **6 Claims**

1. A compound of the formula



wherein R is C_1–C_4 alkyl; R_{30} is hydrogen or R_{30} and R taken together form a methylene moiety;

wherein D is cis>C=C(R_3)—, trans>C=C(R_3)— or >CHCH_2, wherein R_3 is hydrogen or fluoro; wherein Z is:

(1) —CH_2—$(CH_2)_f$—C(R_4)$_2$— wherein each R_4 is the same and is hydrogen or fluoro, and f is zero, one, 2 or 3;

(2) trans—CH_2—CH=CH—; or

(3) —(Ph)—$(CH_2)_g$— wherein Ph is 1,2-, 1,3-, or 1,4-phenylene and g is zero, one, 2 or 3; with the proviso that when Z is —(Ph)—$(CH_2)_g$—, R_3 is hydrogen;

wherein Q is

(1) —$COOR_5$, wherein R_5 is

(a) hydrogen,

(b) (C_1–C_{12})alkyl,

(c) (C_3–C_{10})cycloalkyl,

(d) (C_7–C_{12})aralkyl,

(e) phenyl optionally substituted with one, 2 or 3 chloro or (C_1–C_4)alkyl,

(f) phenyl substituted in the para-position with —NH-COR_6, —COR_7, —OC(O)R_8 or —CH=N—NH-$CONH_2$, wherein R_6 is methyl, phenyl, acetamidophenyl, benzamidophenyl or —NH_2; R_7 is methyl, phenyl, —NH_2, or methoxy; and R_8 is phenyl or acetamidophenyl;

(g) phthalidyl,

(h) 3-(5,5-dimethyl-1,3,2-dioxaphosphorinan-2-yl)-2-oxopropan-1-yl P-oxide.

(i) 3-(5,5-di(hydroxymethyl)-1,3,2-dioxaphosphorinan-2-yl)-2-oxopropan-1-yl P-oxide, or

(j) a pharmacologically acceptable cation;

(2) —CH_2OH;

(3) —COL_2, wherein L_2 is

(a) an amino group of the formula —NR_9R_{10} wherein R_9 is hydrogen or (C_1–C_{12})alkyl and R_{10} is

(i) hydrogen

(ii) (C_1–C_{12})alkyl

(iii) (C_3–C_{10})cycloalkyl,

(iv) (C_7–C_{12})aralkyl

(v) phenyl optionally substituted with one, 2 or 3 chloro, (C_1–C_3)alkyl, hydroxy, carboxy, (C_2–C_5)alkoxycarbonyl, or nitro,

(vi) (C_2–C_5)carboxyalkyl,

(vii) (C_2–C_5)carbamoylalkyl,

(viii) (C_2–C_5)cyanoalkyl,

(ix) (C_3–C_6)acetylalkyl,

(x) (C_7–C_{12})benzoalkyl, optionally substituted by one, 2, or 3 chloro, (C_1–C_3)alkyl, hydroxy, (C_1–C_3)alkoxy, carboxy, (C_2–C_5)-alkoxycarbonyl, or nitro,

(ix) pyridyl, optionally substituted by one, 2, or 3 chloro, (C_1–C_3)alkyl, or (C_1–C_3)alkoxy,

(xii) (C_6–C_9)pyridylalkyl optionally substituted by one, 2, or 3 chloro, (C_1–C_3)alkyl, hydroxy, or (C_1–C_3)alkyl,

(xiii) (C_1–C_4)hydroxyalkyl,

(xiv) (C_1–C_4)dihydroxyalkyl,

(xv) (C_1–C_4)trihydroxyalkyl;

(b) cycloamine selected from the group consisting of pyrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrroline, or 3,4-didehydropiperidinyl optionally substituted by one or 2 (C_1–C_{12})alkyl;

(c) carbonylamino of the formula —$NR_{11}COR_{10}$, wherein R_{11} is hydrogen or (C_1–C_4)alkyl and R_{10} is other than hydrogen, but otherwise defined as above;

(d) sulfonylamino of the formula —$NR_{11}SO_2R_{10}$, wherein R_{11} and R_{10} are defined in (c);

(4) —$CH_2NL_3L_4$, wherein L_3 and L_4 are hydrogen or (C_1–C_4)alkyl, being the same or different, or the pharmacologically acceptable acid addition salts thereof when Q is —$CH_2NL_3L_4$; or (5) —CN;

wherein L is H,H; α-OR_{12},β-H; α-H,β-OR_{12}; α-CH_2OR_{12},β-H; α-H,β-CH_2OR_{12} wherein R_{12} is hydrogen or a hydroxyl protective group;

wherein Y is trans —CH=CH—, cis—CH=CH—, —CH_2C-H_2—, or —C≡C—;

wherein M is α-OR_{12},β-R_{14}; or α-R_{14},β-OR_{12}, wherein R_{12} is as defined above, and R_{14} is hydrogen or methyl;

wherein L_1 is α-R_{15},β-R_{16}; α-R_{16},β-R_{15}; or a mixture thereof wherein R_{15} and R_{16} are hydrogen, methyl, or fluoro being the same or different with the proviso that one of R_{15} and R_{16} is fluoro only when the other of R_{15} and R_{16} is hydrogen or fluoro; wherein

taken together is —C_pH_{2p}CH=CH_2 wherein p is an integer of from 3 to 7, and individual optical isomers thereof.

4,628,111

N-BENZYLOXYCARBONYL-L-THREONINE AMIDE HEMIHYDRATE

Akihiro Mashiba, Tokyo; Kazuteru Hagita, Oomiya; Yoshinobu Miyazawa, Tokyo; Tetsushi Saino, Yono, and Yasuhisa Tashiro, Yokohama, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1985, Ser. No. 723,658

Claims priority, application Japan, Apr. 26, 1984, 59-82962

Int. Cl.[4] C07C *125/065*

U.S. Cl. 560—159 **1 Claim**

1. Non-hygroscopic N-Benzloxycarbonyl-L-threonine amide hemihydrate crystal.

4,628,112

AMINES, PROCESSES FOR THEIR PREPARATION AND THEIR USE IN COMPOSITIONS WHICH CAN UNDERGO FREE RADICAL POLYMERIZATION

Jens Winkel, Cologne; Gerhard Klein, Monheim; Helmut-Martin Meier, Hattingen; Carlhans Süling, Odenthal, and Dieter Arlt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

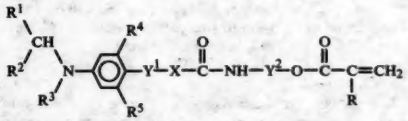
Filed Nov. 28, 1984, Ser. No. 675,689

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345103

Int. Cl.[4] C07C *125/065*

U.S. Cl. 560—160 **12 Claims**

1. A compound of the formula



in which

R represents hydrogen or a methyl group,

Y^1 represents an optionally branched alkylene radical with 1 to 6 C atoms,

Y^2 represents an optionally branched alkylene radical with 2 to 8 C atoms,

X denotes oxygen or an —NH— group,

R^1 and R^2 are identical or different and denote hydrogen, or an alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, aralkyl or alkylaryl group which has up to 11 C atoms and is optionally substituted by one or more,
hydroxyl or amino, groups, or
R^1 and R^2 together form a 3-membered to 6-membered ring, which optionally contains nitrogen, oxygen or sulphur as hetero-atoms,
R^3 has the meaning of R^1 or represents a group

or
R^2 and R^3, together with the

group, form a 5-membered or 6-membered ring, which optionally contains oxygen as a further heteroatom, and
R^4 and R^5 are identical or different and represent hydrogen, an alkyl or alkenyl group which has up to 10 C atoms and is optionally substituted by halogen, or halogen.

4,628,113

ALCOHOL CARBONYLATION PROCESS USING A BIMETALLIC COBALT CATALYST

Steven P. Current, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1982, Ser. No. 393,934
Int. Cl.[4] C07C *29/32, 31/08, 45/49, 51/12, 67/36*
U.S. Cl. 560—232 **10 Claims**

1. A process for the preparation of carboxylic acids, alcohols, aldehydes or carboxylic acid esters which comprises reacting a primary, secondary, or tertiary alcohol having from one to about twenty carbon atoms with hydrogen and carbon monoxide at a temperature in the range of about 150° C. to 350° C. and a pressure in the range of about 500 psig to 5,000 psig in the presence of a heterogeneous sulfided catalyst comprising a composite of sulfides of a cobalt component and a Group V-B, VI-B or Actinide element component and in the absense of a halide promoter, wherein the reaction products formed have at least one more carbon atom than the starting alcohol.

4,628,114

CARBOXYLIC ACID ESTER HOMOLOGATION USING A SULFIDED NICKEL CATALYST

Steven P. Current, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 23, 1983, Ser. No. 507,307
The portion of the term of this patent subsequent to Nov. 25, 2003, has been disclaimed.
Int. Cl.[4] C07C *67/36*
U.S. Cl. 560—232 **7 Claims**

1. A process for the conversion of carboxylic acid esters to homologous carboxylic acid esters which comprises reacting a carboxylic acid ester having from two to about twenty carbon atoms with hydrogen and carbon monoxide at a temperature in the range of about 150° C. to 350° C. and a pressure in the range of about 500 psig to 5,000 psig in the presence of a heterogeneous sulfided catalyst comprising a composite of sulfides of a nickel component and a Group VI-B element component cocatalyst and in the absence of a halide promoter.

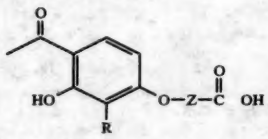
4,628,115

SUBSTITUTED 4-ACETYL-3-HYDROXYPHENOXY ALKANOIC ACIDS

Matthew Carson, Nutley; Ronald A. LeMahieu, North Caldwell, and William C. Nason, Mountain Lakes, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 25, 1985, Ser. No. 715,440
Int. Cl.[4] C07L *59/76*
U.S. Cl. 562—464 **22 Claims**

1. A compound of the formula



I

wherein R is hydrogen or lower alkyl, Z is $—C^*H_2—CH_2—CH_2—C{\equiv}C—$, $—C^*H_2—C{\equiv}C—(CH_2)_3—$, and $—[(CH_2)_2O]_n(CH_2)_2—$ wherein n is an integer of 1 to 3, the carbon atom marked with an asterisk is linked to the phenoxy moiety,
or a salt thereof with a pharmaceutically acceptable base.

4,628,116

VINYL BROMIDE EXTRACTION OF BUTYRIC ACID AND BUTANOL FROM MICROBIAL FERMENTATION BROTH

Richard J. Cenedella, Rte. 1, Box 28, Kirksville, Mo. 63501

Filed Jan. 8, 1986, Ser. No. 519,974
Int. Cl.[4] C07C *29/86, 31/12, 51/48, 53/124*
U.S. Cl. 562—513 **7 Claims**

1. A process of extracting butyric acid and n-butyl alcohol from microbial fermentation broth, containing the same, said process comprising:
contacting an aqueous solution of a microbial fermentation broth having a pH of about 4.0 or less, and containing butyric acid and/or n-butanol with vinyl bromide at a temperature from about 4° C. to about 15° C. to extract said butyric acid and/or said n-butanol from said fermentation broth into said vinyl bromide,
separating said vinyl bromide from said broth, and
separating said butyric acid and/or said n-butanol from said vinyl bromide by evaporation to leave in susbtantially pure isolated form said butyric acid and/or said n-butanol.

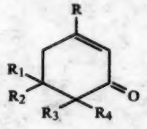
4,628,117

PROCESS FOR THE OZONIZATION OF α,β-UNSATURATED CYCLOHEXANONES TO 5-KETOALKANOIC ACIDS

Hubert J. Sharkey, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 464,454, Feb. 7, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 698,044
Int. Cl.[4] C07C *51/34*
U.S. Cl. 562—577 **12 Claims**

1. A process for the preparation of 5-ketoalkanoic acids from α,β-unsaturated cyclohexanones which comprises:
(1) introducing ozone into a mixture of (a) an α,β-unsaturated cyclohexanone of the formula



where R is a C_{1-18} alkyl group and R_1, R_2, R_3, and R_4 are hydrogen or a C_{1-4} alkyl group, (b) a C_{1-6} saturated aliphatic monocarboxylic acid containing from 0.1 up to 50 percent by weight water, and (c) 0.001 to 1.0 weight percent, based on the α,β-unsaturated cyclohexanone, of a soluble manganous salt, said mixture maintained at a temperature from 15° C. to 50° C. and intimately contacted with said ozone until one mol ozone is reacted per mol of α,β-unsaturated cyclohexanone;

(2) terminating the addition of ozone and maintaining the temperature of the mixture in the range 15° C. to 50° C. until a negative starch iodide test is obtained; and

(3) recovering the 5-ketoalkanoic acid.

4,628,118

5,5-DICHLORO-3,3-DIMETHYLPENTANOIC ACID

Dieter Arlt, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

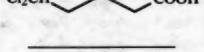
Division of Ser. No. 518,855, Aug. 1, 1983, abandoned. This application Oct. 10, 1985, Ser. No. 786,251

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230274

Int. Cl.⁴ C07C *53/19, 59/147*; C07D *309/30, 309/32*

U.S. Cl. 562—602 **1 Claim**

1. 5,5-Dichloro-3,3-dimethylpentanoic acid of the formula



4,628,119

PROCESS FOR PREPARING HYDRAZINE HYDROHALOGENIDE

Takanari Nawata, Tokyo; Shuzabu Sakaguchi, Ibaraki, and Osamu Aoki, Chiba, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,553

Claims priority, application Japan, Feb. 17, 1984, 59-28323

Int. Cl.⁴ C07C *109/04*

U.S. Cl. 564—314 **10 Claims**

1. A process for preparing a hydrazine hydrohalogenide which comprises the steps of:

(a) oxidizing a benzophenone-imine with molecular oxygen in the presence of a copper halide catalyst and benzophenone as a solvent, at a temperature of from 60° to 250° C. under an oxygen partial pressure of from 0.01 to 20 atms to produce a benzophenone-azine;

(b) contacting the oxidation reaction mixture obtained in step (a) with a 10 to 60 wt% aqueous solution of a hydrohalogenic acid in an amount of from 0.8 to 2 moles per mole of the benzophenone-azine at a temperature of from 60° to 200° C. under a pressure of from 0.1 to 10 atms, thereby hydrolyzing the benzophenone-azine to produce a hydrazine hydrohalogenide and, at the same time, extracting and removing the catalyst from the reaction mixture with the hydrohalogenic acid-containing aqueous solution, to obtain an aqueous solution containing the hydrazine hydrohalogenide and the catalyst;

(c) separating the aqueous solution containing the hydrazine hydrohalogenide and catalyst which is obtained in step (b) and adjusting the solution to a pH of from 3 to 7 with an alkali in the absence of oxygen;

(d) contacting the aqueous solution of pH 3 to 7 obtained in step (c) with benzophenone-imines at a temperature of from 0° to 200° C. in the absence of oxygen to extract the catalyst from the aqueous solution with the benzophenone-imines; and

(e) separating the benzophenone-imines solution containing the catalyst and the aqueous solution containing the hydrazine hydrohalogenide, to thereby recover the hydrazine hydrohalogenide as an aqueous solution and to recycle the solution containing the catalyst to step (a).

4,628,120

PREPARING METHOD OF OPTICALLY ACTIVE KETONES

Genichi Tsuchihashi, Tama, and Keisuke Suzuki, Chigasaki, both of Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1984, Ser. No. 661,440

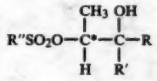
Claims priority, application Japan, Oct. 19, 1983, 58-195487

Int. Cl.⁴ C07C *45/51*

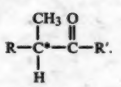
U.S. Cl. 568—322 **19 Claims**

1. In a Pinacol-type rearrangement, the improvement comprising:

contacting an optically active sulfonyloxy alcohol of the formula:



wherein R is a C_2 to C_{20} hydrocarbon group, R′ is a C_1 to C_{20} hydrocarbon group, R″ is a C_1 to C_{20} hydrocarbon group, and * represents an asymmetric center, and wherein R is more electron donative than R′ except when R and R′ are identical, with an organoaluminum compound of the formula $R_n'''AlX_{3-n}$, wherein R‴ is a C_1 to C_{20} hydrocarbon group, X is a hydrogen atom, and $0<n\leqq 3$, to obtain an optically active ketone of the formula



4,628,121

PREPARATION OF ACETALDEHYDE

Nabil Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., Little Ferry, N.J.

Filed Sep. 27, 1985, Ser. No. 780,861

Int. Cl.⁴ C07C *45/49*

U.S. Cl. 568—487 **6 Claims**

1. A process for the preparation of acetaldehyde which comprises reacting methanol with carbon monoxide and hydrogen in the presence of a catalyst composition comprising a cobalt component selected from the group consisting of carboxylates, carbonyls, oxides, hydroxides, carbonates, halides, and mixture thereof, a tin component selected from the group consisting of carboxylates, halides, oxides, inorganic salts, organo-tin compounds, and mixtures thereof, and a halogen component selected from the group consisting of elemental halogens, iodides, salts, organic halides, and mixtures thereof, wherein the molar ratio of the halogen to the cobalt is, at most, 5:1, said reaction being carried out at a temperature of 100°–180° C. and a pressure of 800–5000 psig.

4,628,122

PROCESS FOR CONCENTRATING AND RECOVERING CHLORAL

Frederick J. Kuntz, Lake Charles, La., and Henry W. Schussler, North Canton, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 1, 1985, Ser. No. 793,876

Int. Cl.⁴ C07C *45/80*

U.S. Cl. 568—492 **22 Claims**

1. In the method wherein:

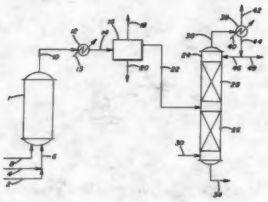
(a) a feed composition comprising both aqueous hydrochloric acid and from about 1 to about 12 percent by weight chloral is introduced to a stripping zone;

(b) aqueous hydrochloric acid containing chloral is counter-

currently contacted in said stripping zone with steam or reboiled aqueous acid vapors under superatmospheric pressure conditions to produce a purified, aqueous hydrochloric acid solution having a lower concentration of chloral than said feed composition; and

(c) at least a portion of said solution is recovered, the improvement comprising:

(d) introducing liquid reflux to a rectifying zone at a reflux ratio of from about 0.4:1 to about 15:1, said liquid reflux



comprising water and chloral in which the chloral concentration is in the range of from 30 to about 89 percent by weight;

(e) countercurrently contacting in said rectifying zone under superatmospheric pressure conditions, vapors comprising hydrochloric acid vapor and chloral vapor with descending liquid comprising chloral and water; and

(f) recovering a product comprising chloral and water in which the chloral concentration is in the range of from 30 to about 89 percent by weight.

4,628,123

PROCESS FOR THE SYNTHESIS OF 2-METHOXY-6-BROMO-NAPHTHALENE

Giampiero Borsotti, Novara, Italy, assignor to Montedison S.p.A., Milan, Italy

Filed Oct. 22, 1985, Ser. No. 790,220

Claims priority, application Italy, Oct. 23, 1984, 23280 A/84

Int. Cl.[4] C07C *41/22, 41/24*

U.S. Cl. 568—634 **12 Claims**

1. A process for the synthesis of 2-methoxy-6-bromo-naphthalene, wherein 2-methoxy-naphthalene, in solution in a carboxylic acid, is brominated by means of bromine to 1,6-dibromo-2-methoxy-naphthalene and the latter is then dehalogenated, without any separation from the liquid medium of reaction, by the addition of iron.

4,628,124

TETRABROMOBISPHENOL-A PROCESS

Bonnie G. McKinnie, Baton Rouge, La., and Olan W. Mitchell, Magnolia, Ark., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 23, 1985, Ser. No. 778,710

Int. Cl.[4] C07C *39/16*

U.S. Cl. 568—726 **9 Claims**

1. A process for brominating bisphenol-A to make mainly tetrabromobisphenol-A while minimizing the formation of by-products, said process comprising:

(a) dissolving bisphenol-A in methanol in a weight ratio of about 1–6 parts methanol per each part bisphenol-A,

(b) feeding a solution of bromine in methanol to the bisphenol-A solution with stirring the bromine:methanol weight ratio in said bromine solution being about 1–4:1, and

(c) recovering tetrabromobisphenol-A.

4,628,125

MONOMERS CONTAINING BIS(TRIFLUOROMETHYL)BIPHENYLENE RADICALS

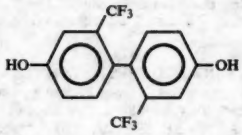
Howard G. Rogers, Weston, Mass.; Russell A. Gaudiana, Merrimack, N.H., and Richard A. Minns, Arlington, Mass., assignors to Polaroid Corporation, Patent Dept., Cambridge, Mass.

Division of Ser. No. 414,473, Sep. 2, 1982, Pat. No. 4,433,132. This application Feb. 9, 1984, Ser. No. 578,694

Int. Cl.[4] C07C *39/15*

U.S. Cl. 568—730 **1 Claim**

1. The compound having the formula



4,628,126

PROCESS FOR THE PRODUCTION OF DIHYDROXYBENZENES

Karlheinz Drauz, Freigericht, and Axel Kleemann, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,847

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1983, 3308726

The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.

Int. Cl.[4] C07C *37/00*

U.S. Cl. 568—771 **43 Claims**

1. A process for the production of a dihydroxy phenol or hydroxyphenyl ether comprising reacting phenol, a substituted phenol, or a phenol ether with hydrogen peroxide in a high boiling organic solvent having not over 1 weight % of water, which organic solvent does not form an azeotrope with water or which forms an azeotrope with water that boils near or above the boiling point of hydrogen peroxide at normal pressure and using a catalyst of the formula XO_2 wherein X is sulfur, selenium, or tellurium.

4,628,127

HETEROGENEOUS CATALYTIC ALKYLATION

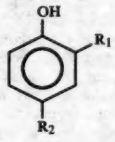
Silas W. Holmes, Columbia; Edward A. Burt, and Dixie E. Goins, both of Orangeburg, all of S.C., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 25, 1985, Ser. No. 748,744

Int. Cl.[4] C07C *37/14, 39/06*

U.S. Cl. 568—781 **33 Claims**

1. A process for producing 2,4-di-substituted phenols comprising reacting an ol-efin and a phenol of structure I:



(I)

wherein one of R_1 and R_2 is H and the other is independently selected from the group consisting of H, alkyl of from 1–12 carbon atoms, cycloalkyl of from 5–12 carbon atoms, and aralkyl of from 7–12 carbon atoms; said reacting being carried out in the presence of a heterogeneous catalyst comprising an aluminum phenoxide bonded to a solid polymeric resin having acidic functional groups; and forming as the major product 2,4-di-substituted phenol.

4,628,128

PROCESS FOR THE PREPARATION OF ETHYLENE GLYCOL BY CATALYTIC HYDROGENATION

William J. Bartley, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 4, 1985, Ser. No. 697,926
Int. Cl.[4] C07C 29/136, 31/20
U.S. Cl. 568—864 17 Claims

1. A process for the preparation of ethylene glycol comprising the steps of contacting, in the vapor phase, hydrogen, with at least one of di(lower alkyl) oxalate and lower alkyl glycolate in the presence of a hydrogenation catalyst comprising from about 1 to about 50% by weight, based on the total weight of the catalyst, of copper, and a silica carrier, wherein the silica carrier is characterized by a relative activity index of at least about 1.0, said relative activity index being defined by the formula, relative activity index = $1.38+0.39a+0.76b+0.001c+0.35d-0.39ab+0.012bc+0.003cd$, wherein a is defined as the nominal external surface area of a typical carrier particle (S), expressed in square millimeters per particle units, divided by the volume (V) of the same carrier particle, expressed in cubic millimeters per particle units minus 1.96 ($(S/V)-1.96$); b is defined as the pore volume (P) of the carrier, expressed in cc/gram units, minus 0.84 ($P-0.84$); c is defined as the average pore diameter (D), expressed in Angstrom units, minus 169 ($D-169$); and d is defined as the macroporosity variable (M) minus 0.24 ($M-0.24$), wherein the macroporosity variable is assigned a value of 1.0 if said carrier has at least about 20% of its pore volume associated with pores having a diameter of at least about 1000 Angstroms, and a value of zero if said carrier has less than about 20% of its pore volume associated with pores having a diameter of at least about 1000 Angstroms.

4,628,129

PROCESS FOR THE PREPARATION OF ETHYLENE GLYCOL

William J. Bartley, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 4, 1985, Ser. No. 697,927
Int. Cl.[4] C07C 29/136, 31/20
U.S. Cl. 568—864 24 Claims

19. A process for the preparation of ethylene glycol comprising the steps of contacting, in the vapor phase, hydrogen with at least one of di(lower alkyl)oxalate and lower alkyl glycolate in the presence of a hydrogenation catalyst comprising from about 1 to about 50% by weight, based on the total weight of the catalyst, of copper and a silica carrier, wherein the carrier has a leachable iron content not greater than 0.03%, by weight of the carrier, a leachable sulfur content, expressed as sulfate, not greater than 0.04%, by weight of the carrier, and a leachable alkali metal content sufficiently low so as to enhance the physical stability of the catalyst in the process.

4,628,130

PROCESS FOR PRODUCING ALCOHOLS BY HYDROGENOLYSIS OF CARBOXYLIC ACID ESTERS IN THE PRESENCE OF A CATALYST CONTAINING NICKEL AND TIN, GERMANIUM OR LEAD

Jean-Paul Bournonville, Cergy Pontoise; Jean-Pierre Candy, Caluire, and Gil Mabilon, St Germain en Laye, all of France, assignors to Institut Francais du Petrole, Rueil-Maimaison, France

Filed Aug. 8, 1985, Ser. No. 763,596
Claims priority, application France, Aug. 8, 1984, 84 12635
Int. Cl.[4] C07C 29/136, 37/055
U.S. Cl. 568—885 18 Claims

1. A process for manufacturing alcohols, wherein a carboxylic acid ester is treated with hydrogen in the presence of a catalyst containing nickel and at least one second element selected from the group consisting of germanium, tin and lead, characterized in that the catalyst results from the incorporation of at least one hydrocarbyl compound of at least one germanium, tin and lead metal to Raney nickel or a nickel-containing carrier.

4,628,131

VAPOR PHASE NITRATION OF AROMATIC COMPOUNDS

Ignatius Schumacher, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 14, 1984, Ser. No. 671,360
Int. Cl.[4] C07C 79/10; B01J 23/00
U.S. Cl. 568—937 24 Claims

1. In a process for the vapor phase nitration of aromatic compounds where an aromatic compound-containing feed mixture is contacted with a nitrating agent in the vapor phase to produce the corresponding nitroaromatic compound, the improvement comprising conducting the nitration in the presence of a nitration promoting catalyst which consists essentially of:

a Group 4b-Group 3b mixed oxide composition represented by the empirical formula:

$$(M^1_aM^2_bO_c)_x(NO_2)_y$$

wherein M^1 is at least one element selected from Group 4b of the Periodic Table of the Elements, M^2 is at least one element selected from Group 3b of the Periodic Table of the Elements, a is 1, b is 0 to 20, c is a number taken to satisfy the average valences of M^1 and M^2 in the oxidation states in which they exist in the composition, x is 1, and y is 0 to c.

4,628,132

COMPOSITION AND METHOD FOR INHIBITING FORMATION OF POLYMERS DURING GAS SCRUBBING OF MONOMERS

Richard F. Miller, Humble, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 23, 1984, Ser. No. 674,205
Int. Cl.[4] C07C 7/18
U.S. Cl. 585—4 13 Claims

1. A polymerization inhibiting composition for vinyl monomers comprising an aqueous solution of a dialkyl amine of the formula RR'NH, a dialkylhydroxylamine of the formula RR'NOH, and an alkali metal salt of a tertiary-alkylcatechol wherein R and R' are the same or different and each is straight chain or branched alkyl having 2 to 10 carbon atoms, the amount of dialkylamine in the composition is greater than about 0.5 weight percent, and the tertiary-alkyl moiety of tertiary-alkylcatechol has a total of 4 to 21 carbon atoms.

4,628,133

PROCESS FOR THE PREPARATION OF HYDROCARBONS FROM A MIXTURE OF CO AND H_2

Johannes K. Minderhoud; Martin F. M. Post; Swan T. Sie, and Ernst J. R. Sudholter, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 666,527, Oct. 30, 1984. This application Sep. 23, 1985, Ser. No. 779,328
Claims priority, application Netherlands, Nov. 15, 1983, 8303910
The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.
Int. Cl.[4] C07C 27/08
U.S. Cl. 585—310 17 Claims

1. A process for the preparation of C_9^+ hydrocarbons from C_4^- hydrocarbons present in a feed stream and C_8^- hydrocarbons present in a recycle stream which comprises:

(1) passing C_4^- hydrocarbons as a feed stream and C_8^- hydrocarbons as a recycle stream to a steam reforming zone to steam reform said hydrocarbons into a mixture of carbon monoxide and hydrogen at a temperature of from

about 700° to 1000° C. and a pressure of from about 2 to about 25 bars in the presence of a steam reforming catalyst comprising an iron-group metal catalyst and, (2) passing at least a portion of said mixture of carbon monoxide and hydrogen from said steam reforming zone to a synthesis zone at an elevated temperature of about 125° to 350° C. and a pressure of from about 5–100 bar in in contact with a catalyst comprising 3–60 pbw cobalt and 0.1 to 100 pbw of at least a second metal selected from the group consisting of zirconium, titanium and chromium all per 100 pbw of a support selected from the group consisting of silica, alumina and combinations of silica and alumina, which catalyst has been prepared by impregnation or kneading and impregnating in accordance with:

$$(3 + 4R) > \frac{L}{S} > (0.3 + 0.4R),$$

wherein

L=the total quantity of cobalt present on the catalyst, expressed as mg Co/ml catalyst;

S=the surface area of the catalyst, expressed as m^2/ml catalyst; and

R=the weight ratio of the quantity of cobalt deposited on said support by impregnation to the total quantity of cobalt present on the catalyst;

to form a product of a mixture of C_9+ hydrocarbons, unconverted hydrogen, carbon monoxide, steam and a mixture of C_8- hydrocarbons, all of which is withdrawn and separated into (1) a liquid product stream comprising said C_9+ hydrocarbons and (2) a gaseous stream comprising said unconverted hydrogen, carbon monoxide, steam and C_8- hydrocarbons and recycling at least a portion of said gaseous stream as said recycle stream said carbon monoxide, steam, C_8- hydrocarbons and at least a portion of said unconverted hydrogen in the gaseous phase as said recycle stream.

4,628,134

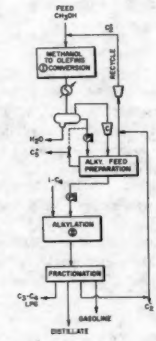
MULTISTAGE PROCESS FOR CONVERTING OXYGENATES TO ALKYLATED LIQUID HYDROCARBONS

Ronald M. Gould, Sewell, and Samuel A. Tabak, Wenonah, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 692,261, Jan. 17, 1985, Pat. No. 4,543,435, and a continuation-in-part of Ser. No. 733,994, May 14, 1985, Pat. No. 4,579,999. This application Sep. 23, 1985, Ser. No. 779,347

Int. Cl.[4] C07C *1/20, 2/00*

U.S. Cl. 585—331 **19 Claims**



1. An integrated continuous process for converting oxygenated organic feedstock to liquid hydrocarbons comprising the steps of

(a) contacting feedstock with zeolite catalyst in a primary catalyst stage at elevated temperature and moderate pressure to convert at least a portion of the feedstock oxygenate to hydrocarbons containing a major fraction of C_2–C_4 olefins and a minor fraction containing C_5+ hydrocarbons;

(b) cooling and separating effluent from step (a) to provide an aqueous liquid byproduct stream, a heavy hydrocarbon liquid stream and a light hydrocarbon vapor stream rich in C_2–C_4 olefins;

(c) compressing at least a portion of the olefinic light hydrocarbon stream to condense a liquid olefinic hydrocarbon stream rich in C_3–C_4 olefins and recovering an ethene-rich gaseous stream;

(d) further reacting the condensed liquid olefinic hydrocarbon stream from step (c) with isobutane in a secondary alkylation stage with acid catalyst to convert at least a portion of C_3–C_4 olefins to a heavier C_7+ liquid hydrocarbon product stream comprising alkylate gasoline; and

(e) recycling ethene in a gaseous stream to the primary catalytic stage.

4,628,135

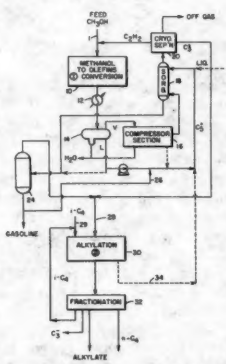
INTEGRATED PROCESS FOR CONVERTING OXYGENATES TO LIQUID HYDROCARBONS

Hartley Owen, Belle Mead; Samuel A. Tabak, Wenonah, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 23, 1985, Ser. No. 779,363

Int. Cl.[4] C07C *1/20, 2/00*

U.S. Cl. 585—331 **12 Claims**



1. An integrated continuous process for converting oxygenated organic feedstock to liquid hydrocarbons comprising the steps of

(a) contacting feedstock with zeolite catalyst in a primary catalyst stage at elevated temperature to convert at least a portion of the feedstock oxygenate predominantly to an olefinic fraction rich in C_2–C_4 olefins and a minor heavy hydrocarbon portion containing C_5+ aliphatic and aromatic hydrocarbons;

(b) cooling and separating effluent from step (a) to provide an aqueous liquid byproduct stream, a heavy hydrocarbon liquid stream and a light hydrocarbon stream rich in C_2–C_4 olefins;

(c) compressing and contacting the light hydrocarbon stream in a sorption tower with a liquid hydrocarbon sorbent stream containing a major amount of said heavy liquid stream from step (b) to selectively sorb C_3+ components in a liquid sorbate stream;

(d) fractionating the sorbate stream to provide a gasoline-

rich stream and a light hydrocarbon stream rich in C_3–C_4 olefins;

(e) further reacting the olefinic light hydrocarbon stream from step (d) with isoparaffin in a secondary alkylation stage in the presence of liquid phase acid catalyst to convert at least a portion of C_3–C_4 olefins to a heavier C_7+ liquid hydrocarbon product stream comprising alkylate gasoline;

(f) recycling ethene in a gaseous stream from the sorption tower to the primary catalytic stage for further conversion; and

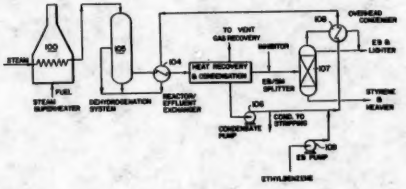
(g) recycling a portion of gasoline from step (d) to step (c) for use as lean sorbent.

4,628,136

DEHYDROGENATION PROCESS FOR PRODUCTION OF STYRENE FROM ETHYLBENZENE COMPRISING LOW TEMPERATURE HEAT RECOVERY AND MODIFICATION OF THE ETHYLBENZENE-STEAM FEED THEREWITH

Helion H. Sardina, Waldwick, N.J., assignor to Lummus Crest, Inc., Bloomfield, N.J.

Filed Dec. 17, 1985, Ser. No. 809,913
Int. Cl.[4] C07C *4/02*
U.S. Cl. 585—441 **11 Claims**



1. In a process for the production of styrene from the catalytic dehydrogenation of ethylbenzene in a dehydrogenation zone at elevated temperatures in the presence of steam, whereby the dehydrogenation effluent is cooled and then separated into three phases consisting of a gaseous phase comprising hydrocarbons, an aqueous phase comprising steam condensate, and an organic phase comprising crude styrene and unreacted ethylbenzene, and whereby said crude styrene is separated from said unreacted ethylbenzene by distillation and the styrene monomer product is recovered, the overhead from the distillation column for separating said crude styrene from said unreacted ethylbenzene being passed into a condenser into indirect heat exchange with a fluid comprising ethylbenzene and water passing through said condenser, the improvement comprising operating the ethylbenzene—water side of said condenser at a pressure between about 8 psia and about 25 psia; operating said column under conditions sufficient for its overhead to have a pressure in excess of about 100 mm mercury; said fluid comprising water and ethylbenzene and being vaporized during said indirect heat exchange into a gaseous mixture; and said gaseous mixture being passed into said dehydrogenation zone.

4,628,137

PROCESS FOR PARA-ETHYLTOLUENE DEHYDROGENATION

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 452,471, Dec. 23, 1982, Pat. No. 4,496,662. This application Sep. 14, 1984, Ser. No. 650,398
Int. Cl.[4] C07C *2/10*
U.S. Cl. 585—445 **6 Claims**

1. In a process of dehydrogenating para-ethyltoluene to selectively form para-methylstyrene comprising contacting the para-ethyltoluene under dehydrogenation reaction conditions with a catalyst composition consisting essentially of:

(a) from about 30% to 60% by weight of iron oxide, calculated as ferric oxide;

(b) from about 13% to 48% by weight of a potassium compound, calculated as potassium oxide; and

(c) from about 0% to 5% by weight of a chromium compound, calculated as chromic oxide,

the improvement wherein the process is conducted with a catalyst composition consisting essentially of, in addition to the components (a), (b) and (c), a modifying component (d) capable of enhancing the conversion of para-ethyltoluene when the modified catalyst is used to provide the preferential formation of para-methylstyrene from para-ethyltoluene, the modifying component (d) being a magnesium compound present to the extent of from about 1% to 15% by weight of the catalyst composition, calculated as magnesium oxide.

4,628,138

CATALYST AND PROCESS FOR OLIGOMERIZATION OF ETHYLENE

Kenneth W. Barnett, Worthington, and Mary J. Brown, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Columbus, Ohio

Filed Sep. 20, 1985, Ser. No. 778,143
Int. Cl.[4] C07C *2/02*
U.S. Cl. 585—531 **15 Claims**

1. A method of oligomerizing an olefin comprising:

contacting said olefin with a nickel-omega zeolite catalyst at a pressure, temperature and for a time effective to cause oligomerization of said olefin;

said catalyst comprising

a nickelocene compound reduced onto an omega zeolite support in the presence an effective amount of a promoter;

wherein the nickelocene compound is selected from the group consisting of (R_a-η^5 cyclopentadienyl) (cyclopentadienyl) Ni and bis(R_a-η^5 cyclopentadienyl) Ni wherein R represents C_1–C_{10} alkyl and "a" represents 0–5; and

wherein the promoter is selected from the group consisting of an oxide of copper, nickel, iron and mixtures thereof.

4,628,139

BIS(1,5-CYCLOOCTADIENE)NI(O) CATALYST AND PROCESS FOR OLIGOMERIZATION OF ETHYLENE

Kenneth W. Barnett, Worthington, Ohio, assignor to Ashland Oil, Inc., Columbus, Ohio

Filed Sep. 20, 1985, Ser. No. 778,147
Int. Cl.[4] C07C *2/02*
U.S. Cl. 585—531 **13 Claims**

1. A method of oligomerizing an olefin comprising:

contacting said olefin with a nickel zeolite catalyst at a pressure, temperature and for a time effective to cause oligomerization of said olefin;

said catalyst comprising

a bis(1,5-cyclooctadiene)Ni (O) compound deposited onto a zeolite support;

wherein the bis(1,5-cyclooctadiene)Ni(O) compound is selected from the group consisting of (R_a- 1,5-cyclooctadiene) (cyclooctadiene) Ni (O) and bis(R_a- 1,5-cyclooctadiene) Ni (O) wherein R represents C_1–C_{10} alkyl and "a" represents 0–8; and

wherein said zeolite support is selected from the group consisting of omega zeolites and type Y zeolites.

4,628,140

PROCESS FOR THE PRODUCTION OF DIENES FROM ALDEHYDES

Lawson G. Wideman, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 3, 1986, Ser. No. 835,494

Int. Cl.[4] C07C *1/24, 1/253*

U.S. Cl. 585—606 11 Claims

1. In a process for the conversion of an aldehyde of 4 to 6 carbon atoms to the corresponding diene which comprises contacting the aldehyde in a vapor phase at a temperature of from 200° to 400° C. with a dehydration catalyst, the improvement comprising the addition of from 0.1to 5.0 percent by weight of an aromatic compound selected from the group consisting of phenol, catechol, alkylated catechol, resorcinol, hydroquinone and aniline; wherein the alkyl radical can be from 1 to 10 carbon atoms; to the aldehyde feed prior to contact with the dehydration catalyst.

4,628,141
FLEXIBLE CONDUIT FIXTURING

James M. Wieszeck, and Paul C. Wieszeck, both of Box 175, Salem, N.H. 03079

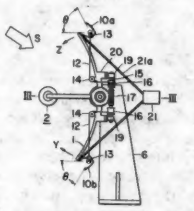
Filed May 28, 1985, Ser. No. 737,782
Int. Cl.[4] H01L *35/28, 35/02*
U.S. Cl. 136—233 5 Claims

1. A thin wire temperature sensing device insertable in a cavity, said cavity having an element inserting end and a closed sensing end, a thin wire element sheathed in spirally convoluted flexible conduit adapted to be mounted in said cavity, and an open-ended, hollow cap adapted to be releasably lockably mounted on the cavity inserting end of said conduit, said cap having fixed therein a spiral spring having a plurality of convolutions interlaced with the convolutions of said conduit whereby constriction of said conduit upon locking of said cap grips said spring to immobilize said conduit relative to said cap.

4,628,142
SOLAR TRACKING MECHANISMS

Kenichi Hashizume, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 18, 1985, Ser. No. 712,539
Claims priority, application Japan, Mar. 19, 1984, 59-51103
Int. Cl.[4] H02N *6/00;* F24J *3/02*
U.S. Cl. 136—246 10 Claims



1. A solar collector including a tracking mechanism for continuously tracking the movement of the sun with time, comprising:

a solar radiant energy receiver secured to be rotatable about a rotating shaft which is supported by a base having a frame;

means connected to said solar radiant energy receiver for tracking the movement of the sun with time; and

means operatively connected to said sun tracking means for rotating said rotating shaft of said solar radiant energy receiver;

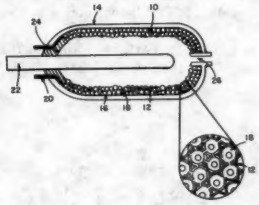
said sun tracking means comprising at least a pair of compound parabolic concentrators, each being secured to a horizontal edge of said solar radiant energy receiver in parallel to said rotating shaft, and shape memory alloy coils each having one end connected to one end of a respective said compound parabolic concentrator and located at a position coincident with a focal line of the respective compound parabolic concentrator.

5. The solar collector according to claim 1, wherein said solar radiant energy receiver comprises a solar cell panel having a plurality of solar cell modules and a support frame for supporting said modules, and wherein said shape memory alloy coil includes means for shrinking into a memorized tightly wound-up coil shape when heated to a predetermined temperature, and wherein the other end of each said shape memory alloy coil is connected to one end of a tension wire, the other end of said tension wire being connected to said means for rotating said rotating shaft.

4,628,143
FOAMED NUCLEAR CELL

Gregory R. Brotz, 218 Pioneer Rd., Sheboygan, Wis. 53081

Filed Mar. 12, 1984, Ser. No. 588,344
Int. Cl.[4] H01L *31/04*
U.S. Cl. 136—253 4 Claims



1. An electric current generating cell comprising:

an open-cellular foamed semiconductor;

a vessel containing such open-cellular foamed semiconductor;

a continuous electroconductive layer formed around the outer sides of said open-cellular foamed semiconductor;

means to excite said semiconductor to produce electric current;

electrode means to carry said electric current outside said open-cellular foam semiconductor, said electrode means being further adapted to form said cells output terminals, said electrodes means including:

a first electrode entered into said vessel and surrounded by said open-cellular foam semiconductor;

a second electrode contiguous with said continuous electroconductive layer around said open-cellular foamed semiconductor; and

said means to excite said semiconductor including:

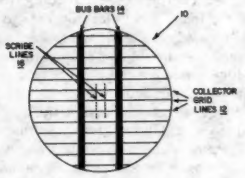
means to enter gas into said cell; and

a gas entered into said cell through said means to enter gas to cause the production of electricity from said cell.

4,628,144
METHOD FOR CONTACT RESISTIVITY MEASUREMENTS ON PHOTOVOLTAIC CELLS AND CELL ADAPTED FOR SUCH MEASUREMENT

Dale R. Burger, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jun. 7, 1983, Ser. No. 501,909
Int. Cl.[4] H01L *31/04;* G01R *27/14*
U.S. Cl. 136—256 11 Claims



7. In a photovoltaic cell having a plurality of electrically interconnected grid contacts for collection of solar current generated by the cell, an improvement comprised of at least three parallel segments of said grid contacts electrically isolated for use in determining parameters of the cell by applying

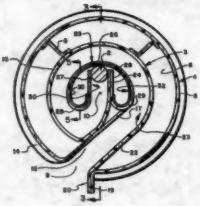
a constant current between a first pair of isolated segments and measuring voltage between a second pair of isolated segments, where said first and second pairs are selected from among said isolated segments and have at least one segment of each pair in common.

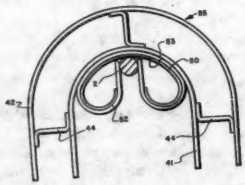
4,628,145

PROTECTIVE COVER FOR ELECTRICAL CONDUCTORS

Nestor Kolcio, 11500 Jerome Rd., Plain City, Ohio 43064, and Richard A. Peszlen, 5675 Lindenwood Rd., Columbus, Ohio 43229

Filed Nov. 22, 1985, Ser. No. 800,752
Int. Cl.[4] H02G *1/02*; H01B *17/58*
U.S. Cl. 174—5 R **17 Claims**





1. An improved protective cover adapted to insulate an energized conductor including:

(a) an elongated tubular-shaped member formed by inner and outer housings of dielectric material, said housings being generally circular in cross-section and spaced generally concentric with respect to each other forming an air gap therebetween and being open at a lower side;

(b) spacer means extending between the housings for maintaining the air gap therebetween;

(c) a central sleeve of dielectric material extending generally throughout the longitudinal length of the inner housing and in cross-section having an upper curved portion with a concave surface forming a central space, with said curved portion terminating in an open lower side;

(d) a spiral passageway formed by portions of the inner housing and central sleeve extending from the open lower side of the inner and outer housings to the central space formed by said central sleeve to admit a conductor from the exterior of the tubular-shaped member to said central space for supporting the protective cover in a suspended position on a conductor; and

(e) conductive means provided on the concave surface of the central sleeve extending generally throughout the length of said sleeve adapted to contact an energized conductor when the protective cover is suspended on the energized conductor for increasing the electrical insulation in the vicinity of the energized conductor.

16. An improved protective cover adapted to insulate an energized conductor including:

(a) an elongated member formed by inner and outer housings of dielectric material forming an insulating air gap therebetween, said housings having a generally inverted U-shape in transverse cross section, with said inner housing having a central sleeve of dielectric material extending generally throughout the longitudinal length of said inner housing;

(b) spacer means extending between the housings for maintaining the air gap therebetween; and

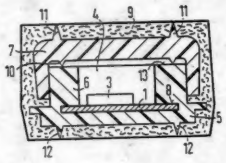
(c) conductive means provided on an inner surface of the central sleeve and extending generally throughout the length of said sleeve and adapted to contact an energized conductor for increasing the electrical insulation in the vicinity of the energized conductor.

4,628,146

CASING FOR ELECTRICAL COMPONENTS, COMPONENT ASSEMBLIES OR INTEGRATED CIRCUITS

Ernst Schmotz, Willing, and Hans Stelzl, Vaterstetten, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 13, 1985, Ser. No. 701,057
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410787
Int. Cl.[4] H05K *5/06*
U.S. Cl. 174—52 PE **6 Claims**



1. A casing for electrical components having an electrically active element where the electrically active element rests on a base strip which projects outgoing connectors through walls of the casing, the connectors providing mechanical and electrical connection to a printed circuit board, the casing comprising a thermosetting-plastic trough which adheres closely to the under surface of the base strip, and having side-walls each having a heel which rests on a border of the upper surface of the base strip, and a thermosetting-plastic lid which is positioned over the thermosetting-plastic trough to form an assembly, the electrically active element being contained in an enclosure of the assembly of thermosetting-plastic trough and lid, the assembly including the enclosed electrically active element being coated in thermosetting plastic.

4,628,147

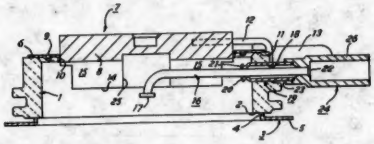
SEMICONDUCTOR HOUSINGS

Roger F. C. Bennett, Melksham, United Kingdom, assignor to Westinghouse Brake and Signal Company Limited, United Kingdom

Filed Apr. 22, 1985, Ser. No. 725,590
Claims priority, application United Kingdom, Apr. 27, 1984, 8410847
Int. Cl.[4] H01L *23/02*
U.S. Cl. 174—52 P **6 Claims**

1. A semiconductor housing for a multi-terminal semiconductor device comprising a hermetically sealed enclosure bounded by a wall of electrically insulating ceramic material, said ceramic material having a first coefficient of expansion, said wall having an aperture and a hollow member passing through said aperture and extending on either side thereof, said hollow member having first and second hermetic seals on opposing end portions, said first and second hermetic seals being spaced from said wall, and a conductive wire passing through said hollow member and establishing a connection from inside said enclosure to connector means outside said

enclosure, said hollow member being formed of material having a coefficient of expansion substantially equal to said first coefficient of expansion, said hollow member being hermetically sealed to said wall within said aperture, said first and second hermetic seals being formed by high temperature brazing, said hollow member being circumferentially spaced from said conductive wire between said hermetic seals, thereby forming an electrical connection of high strength, yet sufficiently resilient to withstand thermal cycling stresses and maintain said hermetic seals about said hollow member.



4,628,148

ENCAPSULATED ELECTRONIC CIRCUIT

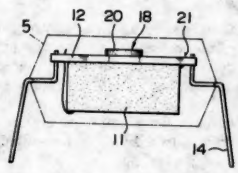
Kunihisa Endou, Kawagoe, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Mar. 20, 1985, Ser. No. 715,177

Claims priority, application Japan, Mar. 27, 1984, 59-43929[U]; Mar. 27, 1984, 59-43930[U]

Int. Cl.⁴ H01F *27/02*

U.S. Cl. 174—52 PE **7 Claims**



1. An electronic component device comprising: a component body including at least one coil and having leads attached thereto; a protecting elastic body in which said component body is entirely embedded, the leads of said component body passing through said elastic body and outside thereof; a base plate having side portions; means for coupling said protecting elastic body and said base plate, said coupling means being provided on said protecting elastic body and on said base plate; external terminals attached to said side portions of said base plate and electrically connected to said leads; said external terminals having free end portions; and encapsulation means surrounding said base plate and said protecting elastic body; the free end portions of said external terminals extending outside said encapsulation.

4,628,149

SUBSTRATE HAVING A PATTERN OF AN ALLOY OF GOLD AND A NOBLE AND A BASE METAL WITH THE PATTERN ISOLATED BY OXIDES OF THE NOBLE AND THE BASE METALS

Akihiro Dohya, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

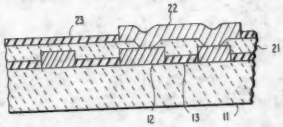
Filed Nov. 24, 1982, Ser. No. 444,097

Claims priority, application Japan, Nov. 30, 1981, 56-190518; May 17, 1982, 57-82917

Int. Cl.⁴ H05K *1/09*

U.S. Cl. 174—68.5 **4 Claims**

1. A wired substrate comprising a substrate having an insulating surface, a conductive pattern directly on said insulating surface, and an insulating layer which lies directly on said insulating surface and contiguous to said conductive pattern and is thinner than said conductive pattern, wherein said conductive pattern is formed of an alloy consisting essentially of gold, a first metal selected from the group consisting of titanium, aluminum and copper and a second metal selected from the group consisting of palladium, ruthenium and rhodium, said first and second metals being included in said alloy in a total amount less than said gold and said insulating layer is formed of a mixture of oxides of said first and second metals.



4,628,150

BONDING AND BONDED PRODUCTS

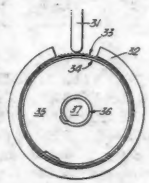
Penelope J. V. Luc, Great Bookham, England, assignor to Luc Technologies Limited, London, England

Filed Jul. 25, 1983, Ser. No. 516,910

Claims priority, application United Kingdom, Jul. 27, 1982, 8221702; Jul. 30, 1982, 8222100

Int. Cl.⁴ B23K *1/02, 20/12;* H01R *43/02*

U.S. Cl. 174—88 C **19 Claims**



1. An electrical assembly including a first electrical or electronic component with a first plurality of conductors disposed in a first linear array and further including a second electrical or electronic component with a second plurality of conductors disposed in a second linear array, the conductors of said first linear array being aligned with and bonded to respective conductors of said second linear array, the bonding between the conductors being achieved by a friction bonding process wherein a rotating friction wheel in contact with an outer surface of one of said first and said second component is translated along a linear path to bond the conductors of said first array one after the other to the respective conductors of said second array, the conductors of said first array being in contact with the respective conductors of said second array during the translation of said friction wheel, the bonds between the conductors of said first array and the respective conductors of said second array being permanent conductive metallurgical bonds.

2. An electrical assembly of at least two components having predetermined forms and including an end portion of an outer conductor of an electrical cable and a cable jointing element bonded to one another, a surface of one of said components extending along the length thereof overlapping a surface of the other of said components extending along the length thereof, said cable jointing element being bonded to said outer conductor along the overlapping surfaces of said components by a friction bonding process wherein a relative rubbing movement is produced between a rotating friction wheel and an outer surface of one of said components facing away from an interface between said components while substantially maintaining the predetermined forms of said components, whereby a per-

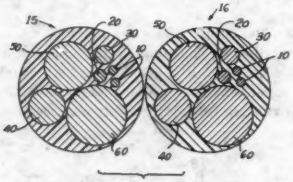
manent conductive metallurgical bond is formed between said components.

4,628,151

MULTI-STRAND CONDUCTOR CABLE HAVING ITS STRANDS SIZED ACCORDING TO THE GOLDEN SECTION

George F. Cardas, 1158 N. Columbia, Ontario, Calif. 91764

Filed Dec. 30, 1985, Ser. No. 814,727
Int. Cl.[4] H01B *7/00, 11/00*
U.S. Cl. 174—114 R **9 Claims**



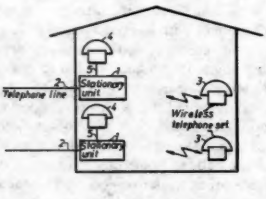
1. A multi-strand conductor cable comprising a plurality of individual conductors insulated from one another wherein the plurality of conductors is characterized by having at least one conductor of each of at least three different diameters wherein the ratio of one diameter to the next larger diameter is approximately as the ratio of the next larger diameter is to the sum of the one diameter and the next larger diameter.

4,628,152

METHOD AND APPARATUS FOR TRANSMISSION OF TELEPHONE CALLS TO A PORTABLE, WIRELESS TELEPHONE SET

Dag E. Akerberg, S-17563 Järfälla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Aug. 11, 1983, Ser. No. 522,410
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—51 **14 Claims**



1. A method of coupling a stationary unit, said unit being provided with a radio transmitter and a radio receiver and connected to a telephone line, with a coacting portable, wireless telephone unit provided with a radio transmitter and a radio receiver at a relatively short distance from the stationary unit, the method comprising the steps of

independently searching by means of the radio receiver belonging to a first of the coacting units and a channel selector connected to said receiver for a usable radio speech channel among radio speech channels common to at least the pair of coacting units, said channels having respective numbers, and

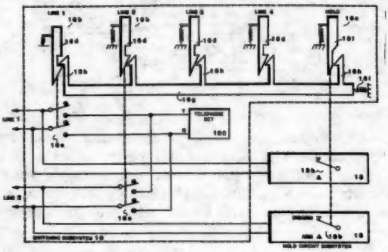
sending, on a radio signalling channel to the second of the coacting units, a coded call from the first unit and the number of the usable radio speech channel, the signalling channel being an unvarying radio signalling channel common to the pair of units.

4,628,153

STAND-ALONE KEYPHONE SYSTEM

Marshall Daly, 740-A Cieneguitas St., Santa Barbara, Calif. 93110

Filed Dec. 17, 1984, Ser. No. 682,194
Int. Cl.[4] H04M *1/00*
U.S. Cl. 379—163 **12 Claims**



1. A stand-alone keyphone system comprising:

A. a telephone set,

B. a key adapter set integrally connected to said telephone set where said key adapter set comprises:

(1) a switching subsystem further comprising:

(a) a mechanically latched pushbutton assembly further comprising:

(1) a plurality of telephone line pushbuttons that provide the means to allow said telephone set to be connected to any of the telephone lines connected to said system,

(2) a hold pushbutton section that when pressed, disconnects said telephone set load from the circuit and connects a hold load onto the circuit that places the selected telephone line in a hold status, where said hold pushbutton section includes a non-latching straight post having an upper override camming slope extending outwardly from upper part of said post,

(b) a telephone line connect switch connected to each telephone line where switch is mechanically linked and actuated by the respective said telephone pushbutton where when said switch is closed by said telephone pushbutton an electrical contact is made that allows said telephone set to be connected to the corresponding telephone line,

(2) a plurality of hold circuit subsystem means where each of said hold circuit subsystem means allows said telephone set to be temporarily disconnected from the telephone line selected by said switching means,

(3) a line status display subsystem means that monitors and displays the status of each of said telephone lines connected to said key adapter set, and

C. a system power supply having means to supply said system with required voltages and currents.

4,628,154

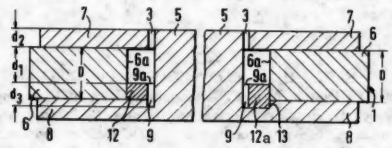
ANNULAR GAP MAGNET SYSTEM, PARTICULARLY FOR LOW FREQUENCY LOUDSPEAKERS

Eckehard K. Kort, Lichtenhagen 28, 3251 Ottenstein 2, Fed. Rep. of Germany

Filed Dec. 23, 1982, Ser. No. 452,769
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151530; Sep. 17, 1982, 8226166[U]
Int. Cl.[4] H04R *9/02*
U.S. Cl. 381—189 **9 Claims**

3. An annular gap magnet system, particularly for low frequency loudspeakers, comprising a moving coil moveable in the working air gap, said working air gap having an outer diameter, a cylindrical pole core of soft iron; an annular perma-

nent magnet arranged at a distance from said pole core; a first pole plate which limits the outer diameter of the working air gap; a second pole plate contacting said pole core and having a cross-section, said annular permanent magnet being positioned between said first and second pole plates, said second pole plate being at a distance from said first pole plate which is at least equal to the thickness of said first pole plate, wherein a braking air gap is formed surrounding said pole core adjacent to said second pole plate as an axial extension of the working



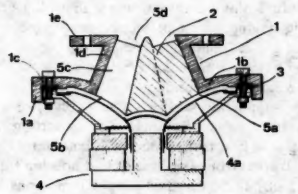
air gap, wherein said braking air gap extends into said second pole plate for decreasing the cross-section of said second pole plate below the bottom of said braking air gap to produce a magnetic resistance, wherein there is a magnetic flux through the braking air gap and a stray flux above the braking air gap, both fluxes directed opposite to a magnetic flux in the working air gap and also oppositely to a stray flux below the working air gap, wherein the flux in the braking air gap is at least equal in magnitude to the stray flux below the working air gap.

4,628,155

ELECTROACOUSTIC MOTOR FOR HORNS

Philippe Robineau, 51 rue Truffaut, 75017 Paris, and Eric Vincenot, 12, rue Léon Giraud, 75019 Paris, both of France

Continuation of Ser. No. 397,194, Jul. 12, 1982. This application Oct. 19, 1984, Ser. No. 662,508
Int. Cl.⁴ G10K *13/00*
U.S. Cl. 381—156 **22 Claims**



1. An acoustic adaptor for acoustically and mechanically coupling a selected horn to a direct radiation cone type speaker including a diaphragm flaring towards and attached to a rim of a speaker chassis, said acoustic adaptor comprising:
- means for center said adaptor with respect to the axis of the speaker;
- sealing means defining a fluid-tight connection between the speaker chassis rim and said adaptor;
- means for securing the speaker chassis to said adaptor;
- a tapered annular portion of configuration complementary to an outer annular zone of the diaphragm for defining with the outer annular zone part of a compression chamber;
- a projecting tubular portion extending from the radially inner periphery of said tapered annular portion and having an input orifice defined within said tapered annular portion and an output orifice at an end remote from said tapered annular portion for communication with a horn; and
- means at the end of said tubular portion adjacent said output orifice for mounting said adaptor to the horn.

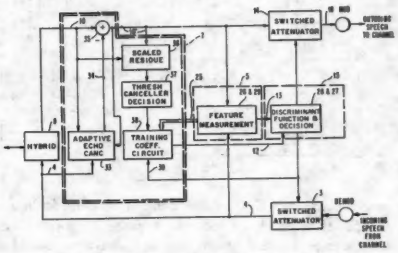
5. The acoustic adaptor according to claim 1, wherein said sealing means is accommodated in a recess adapted to face a flat sealing surface on the speaker chassis rim.

4,628,156

CANCELLER TRAINED ECHO SUPPRESSOR

David R. Irvin, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,322
Int. Cl.⁴ H04B *3/20*
U.S. Cl. 379—410 **3 Claims**



2. An improved echo control means for a multiple voice link speech coder communication system comprising:
- a plurality of voice links;
- a speech coder;
- at least one trainer means comprising an adaptive echo canceller connectable individually to each said voice link;
- a suppressor circuit connected to each said voice link;
- a monitor means connected to each said voice link for obtaining signal feature measurements thereof and individually supplying said feature measurements to said trainer means and to the respective suppressor circuit connected to each respective voice link;
- said trainer means utilizing said feature measurements from each said voice link and, responsive thereto, generating control coefficients for each suppressor circuit connected to each said voice link; and
- means for supplying said control coefficients to each said suppressor circuit connected to each said voice link.

4,628,157

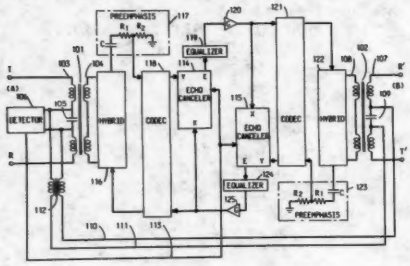
BIDIRECTIONAL ADAPTIVE VOICE FREQUENCY REPEATER

Christopher P. Chance, Winston-Salem; Ralph P. Coble, Jr., Greensboro; Edwin C. Ingle, Jamestown, and Joye A. Jones, Greensboro, all of N.C., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 7, 1984, Ser. No. 648,327
Int. Cl.⁴ H04B *3/20*
U.S. Cl. 379—410 **10 Claims**

1. A signal transmission network including:
- at least first means adapted to connect said transmission network to at least a first bidirectional transmission facility;
- at least first echo canceler means for cancelling echo signals resulting in said transmission network because of said first bidirectional transmission facility, said echo canceler means including signal processor means for generating a predetermind number of amplitude coefficients which form an impulse response characteristic, said signal processor means being adapted to be supplied with an input signal and being responsive to an error signal for generating an estimate of an echo signal to be canceled by adjusting said impulse response characteristic, and means for algebraically combining said echo signal estimate with an outgoing signal to generate said error signal; and
- at least first preemphasis means comprising a high pass filter

supplied with signals incoming to said at least first echo canceler means for shaping low frequency signal components as a function of energy in said incoming signals within a voice frequency pass band to obtain a prescribed low frequency roll-off function for voice frequency transmission within said voice frequency pass band so that said amplitude coefficients form an impulse response characteristic to generate said echo signal estimate without being responsive to excessive low frequency components in said incoming signals.

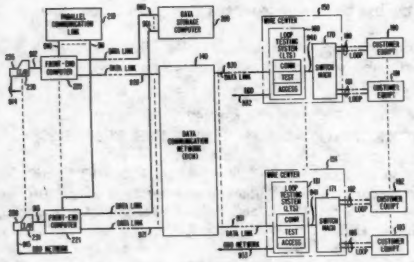


4,628,158

STORED PROGRAM CONTROLLER

Harvey Rubin, Morristown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 16, 1982, Ser. No. 399,175
Int. Cl.[4] H04J *3/14;* H04M *3/22*
U.S. Cl. 379—10 **12 Claims**
MICROFICHE APPENDIX INCLUDED
(42 Microfiche, 2554 Pages)



1. In a data communications or telephone system, a controller for processing a series of request messages received over an input bus and for distributing corresponding command messages of predetermined types derived from each of said request messages over output busses connected to said controller, said controller comprising

microprocessor means (e.g., **2045**) having an accessible memory, interrupt processing circuitry (**2010**) including an interrupt processing routine to signal the completion of events and a multitasking operating system including means for scheduling, according to a predetermined priority, corresponding tasks to be initiated as a result of said completion of events,

input means (e.g., **2070**), connected to said input bus and serviced at interrupt level by said microprocessor means, for assembling said command messages by interpreting each of said request messages, for storing said command messages in allocated buffers in said memory and for signaling message-complete events, and

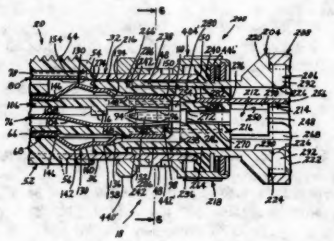
output means (e.g, **2045**), connected to said output busses and serviced at interrupt level by said microprocessor means, said output means including a task processor associated with each of said command message types for accessing an associated one of said buffers as directed by said microprocessor means, for extracting said corresponding command message, and for formatting and transmitting each said corresponding command message over one of said output busses.

4,628,159

ELECTRICAL CONNECTOR APPARATUS

James C. Deitch; Nels E. Kemppainen, both of Bloomington; James D. Bradley, Mound, and George B. Pfeffer, Minnetonka, all of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Nov. 6, 1984, Ser. No. 668,754
Int. Cl.[4] H01R *19/00*
U.S. Cl. 200—51.05 **10 Claims**



1. A jack for mounting on a circuit board, said jack for receiving one of a first plug and a second plug, said first plug having one first plug conductor and a first plug ground, said second plug having a pair of second plug conductors and a second plug ground, said jack comprising:

a housing having a base and a barrel;

first and second jack conductors;

means for supporting said first and second jack conductors with respect to said housing, said supporting means supporting said first and second jack conductors at one end for protrusion from said base of said housing for mounting on said circuit board, said supporting means supporting said first and second jack conductors at a second end within said barrel, said supporting means including means for insulating said first and second jack conductors from one another; and

means for maintaining ground continuity with one of said first plug ground and said second plug ground of said one of said first and second plugs when said one of said first and second plugs is received by said jack, said first conductor including means for switching between open and closed continuity positions with said ground continuity means, said switching means being closed when said first plug is received by said jack, said switching means being open when said second plug is received by said jack;

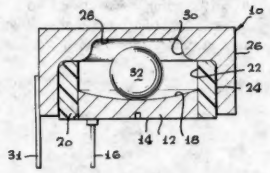
whereby said first jack conductor is in continuity with said one first plug conductor of said first plug and said second jack conductor is in continuity with said ground continuity means when said first plug is received by said jack and said first and second jack conductors of said jack are in continuity with said pair of second plug conductors of said second plug and said first jack conductor is disconnected from said ground continuity means when said second plug is received by said jack.

4,628,160

ELECTRICAL TILT SWITCH

Ronald D. Canevari, Panorama City, Calif., assignor to Allied Corporation, Morristown, N.J.

Filed Oct. 28, 1985, Ser. No. 791,829
Int. Cl.[4] H01H *35/14*
U.S. Cl. 200—61.45 R 4 Claims



1. An electrical tilt switch including a pair of electrical contacts and moveable means for making and breaking electrical continuity between said contacts,

characterized in that said switch comprises a generally cylindrical cap member having a ridge extending internally of its internal sidewall and spaced a significant distance from its bottom edge such that said sidewall extends only a part of the height of said cap member, the internal top surface of said cap extends only a part of the distance from its center toward said internal sidewall, and a radially inwardly extending surface extends from said internal sidewall, said ridge being form in a generally "S" shaped convex surface from said top surface to said radially inwardly extending surface,

a generally cylindrical base having an upper face having a smooth concave dished surface,

an annular insulating member of generally cylindrical shape having an internal surface fastened to said base member and an external surface fastened to the internal sidewall of said cap member,

electrical leads attached to said cap and base members, and

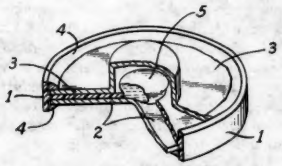
a spherical contact member carried on said concave dished surface and moveable against said ridge when said switch is tilted from the vertical by a specified amount, thereby closing said switch.

4,628,161

DISTORTED-POOL MERCURY SWITCH

James D. Thackrey, 13852 Dall La., Santa Ana, Calif. 92705

Filed May 15, 1985, Ser. No. 734,597
Int. Cl.[4] H01H *35/02*
U.S. Cl. 200—61.47 1 Claim



1. A multidirectional miniature mercury tilt switch with axial terminals, comprising:

a pool of mercury, and

a disc-shaped lower terminal on which said pool of mercury rests when the switch is level, and

an insulating separator having a first portion into which said disc-shaped lower terminal fits, a second portion into which an upper terminal fits, and a third portion comprising a circular central web of which the center is open, the open center being smaller in diameter than said pool of mercury and the central web portion covering the upper surface of said disc-shaped lower terminal except for the open center at which, due to the thickness of the central web portion, said pool of mercury rests, and

said upper terminal shaped generally like a hat, having a rim portion and a head cavity portion, the outside of the rim portion fitting into said second portion of said insulating separator, the sidewall of the cavity portion being of slightly larger diameter than that which said pool of mercury has when the switch is not tilted, and the top closure being far enough above the rim, that is the cavity portion being of sufficient depth, to completely contain said pool of mercury when the switch is inverted, and

sealing means to seal the rim portions of said upper terminal and said lower terminal to said insulating separator,

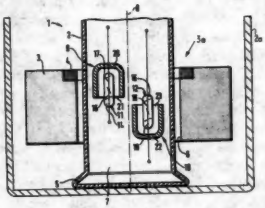
whereby said pool of mercury distorts when the switch is tilted, touching the sidewall of the cavity in said upper terminal and closing the switch.

4,628,162

FLUID LEVEL INDICATOR FOR A RESERVOIR

Hans-Dieter Reinartz, Frankfurt am Main, and Helmut Steffes, Eschborn, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 711,037
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410858
Int. Cl.[4] H01H *35/18*
U.S. Cl. 200—84 C 4 Claims



1. A fluid level indicator for a master cylinder reservoir comprising:

a float mounted on said reservoir for movement in response to changes in the level of fluid in said reservoir;

a magnet mounted to said float at a predetermined location therein for creating a magnetic field;

a contact switch assembly including a magnetically operable reed contact adapted to be electrically coupled to an electrical circuit and a magnetic field shield around said reed contact, said shield including an opening, said reed contact and said shield affixed together with said opening disposed at a constant first predetermined position relative to said reed contact providing for passage of said magnetic field therethrough to operate said reed contact, and said contact switch assembly is fixedly mounted within said reservoir with said opening in said shield disposed at a second predetermined position relative to said reservoir, said first predetermined position of said opening and said second predetermined position of said opening defining a desired fluid level in said reservoir.

4,628,163
POWER SWITCH

Teijiro Mori; Yuichi Wada, both of Hyogo; Masahiro Kakizoe, Aichi; Shigeru Masuda, Aichi, and Shizutaka Nishizako, Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

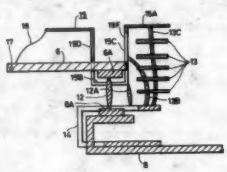
PCT No. PCT/JP84/00578, § 371 Date Aug. 7, 1985, § 102(e) Date Aug. 7, 1985, PCT Pub. No. WO85/02711, PCT Pub. Date Jun. 20, 1985

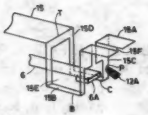
PCT Filed Dec. 7, 1984, Ser. No. 767,293

Claims priority, application Japan, Dec. 7, 1983, 58-231136; Dec. 7, 1983, 58-231140; Mar. 19, 1984, 59-53103; Mar. 19, 1984, 59-53106

Int. Cl.[4] H01H *33/08*

U.S. Cl. 200—144 R 6 Claims





1. A power switch comprising a fixed contact member **8**, a fixed contact **8A** joined to the fixed contact member **8**, a movable contact member **6**, a movable contact **6A** joined to the movable contact member **6** and movable into and out of contact with said fixed contact **8A**, a commutation electrode **15** having a first plate **15A** extending parallel to the surface of said fixed contact **8A** and spaced a prescribed distance from said fixed contact member **8**, a second plate **15B** extending parallel to the surface of said fixed contact **8A** and positioned between the surface **6C** of said movable contact member **6** to which no movable contact **6A** is joined and said fixed contact member **8** at the time said movable contact **6A** and said fixed contact **8A** are separated, a third plate **15C** connecting said first and second plates **15A**, **15B** to each other, a fourth plate **15D** extending from said second plate **15B** in the direction in which said movable contact **6A** is separated, and a recess **15E** defined in a portion confronting said movable contact **6A** and extending from said second plate **15B** to said third plate **15C** and from said second plate **15B** to said fourth plate **15D**, and a plurality of metal extinguishing plates **13** disposed parallel to the surface of said fixed contact member **8** and between said fixed contact member **8** and said first plate **15A**.

4,628,164
ARC CONTACT SYSTEM FOR ELECTRICAL CIRCUIT BREAKERS, IN PARTICULAR OF THE TYPE USING AN ARC EXTINGUISHING FLUID

Gianpietro Talpo, Bergamo, Italy, assignor to SACE S.p.A. Costruzioni Elettromeccaniche, Bergamo, Italy

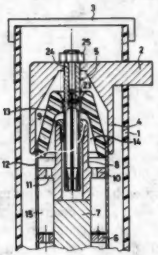
Filed Jan. 30, 1985, Ser. No. 696,524

Claims priority, application Italy, Feb. 10, 1984, 20810/84[U]

Int. Cl.[4] H01H *33/88*

U.S. Cl. 200—148 A 11 Claims

1. An arc contact system for electrical circuit breakers, particularly of the type using an arc extinguishing fluid, comprising a stationary elongated generally cylindrical stationary contact of a predetermined exterior circumference and a movable tubular contact of an interior circumference corresponding generally to said exterior circumference; means mounting said contacts for relative sliding telescopic movement between a first position at which said stationary contact is inserted within said movable contact a predetermined maximum axial extent, a second position at which said contacts are axially spaced from each other and at least a third intermediate position between the first and second positions at which said stationary contact is within said movable contact at an axial distance less than said predetermined maximum axial extent; a nozzle in spaced surrounding relationship to said movable tubular contact and said stationary contact at least in said first and third positions and defining therewith a generally annular



gas chamber, an opening in said nozzle coaxial with and spaced from an end portion of said movable tubular contact through which said stationary contact passes, said movable tubular contact end portion carrying arc resistant material, and passage means formed along said stationary contact extending from a free end portion thereof for an axial length greater than said third intermediate position distance for dispersing compressed gas, prior to said contacts reaching said second position upon relative movement from said first position and while said stationary contact is within said nozzle opening, from said annular gas chamber through said passage means beyond said nozzle.

4,628,165
ELECTRICAL CONTACTS AND METHODS OF MAKING CONTACTS BY ELECTRODEPOSITION

Fred I. Nobel, Sands Point; James L. Martin, Merrick, and Michael P. Toben, Smithtown, all of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Filed Sep. 11, 1985, Ser. No. 774,634

Int. Cl.[4] H01H *1/02*; C25D *3/56, 5/10*

U.S. Cl. 200—268 21 Claims

1. A method for increasing the ductility and reducing the porosity or tendency for cracking in a dual layer palladium alloy electrodeposit upon a substrate which comprises:

electrodepositing a first layer of a palladium/nickel or palladium/cobalt alloy comprising between about 20 and 95 weight percent palladium and between about 5 and 80 weight percent nickel or cobalt upon the substrate in a thickness of at least about 0.5 microinches to increase the ductility and reduce the porosity and tendency for cracking of the dual layer electrodeposit; and

electrodepositing a second layer of palladium or a palladium/silver alloy upon said first layer in a thickness of greater than about 5 microinches for use as an electrical contact, said second layer having a thickness greater than said first layer.

4. A palladium or palladium/silver electrical contact comprising a substrate and a dual layer electrodeposit comprising at least about 0.5 microinches of a first layer of a palladium/-nickel or palladium/cobalt alloy comprising between about 20 and 95 weight percent palladium and between about 5 and 80 weight percent nickel or cobalt and greater than about 5 microinches of a second layer of palladium or a palladium/silver alloy; said second layer being thicker than said frist layer and

providing the electrical characteristics of the electrical contact.

4,628,166

SEALED SLIDE SWITCH

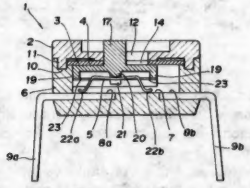
Hideyuki Bingo, Uji; Takashi Yoshimura, Mishima; Masatsuga Yamashita, Kyoto; Shinichi Hashizume, Kusatsu, and Norio Iwakiri, Otokuni, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Sep. 18, 1984, Ser. No. 651,761

Claims priority, application Japan, Sep. 19, 1983, 58-173946; Sep. 19, 1983, 58-145162[U]; Sep. 19, 1983, 58-145163[U]; Sep. 21, 1983, 58-147164[U]

Int. Cl.[4] H01H *9/04*

U.S. Cl. 200—302.1 **4 Claims**



1. A slide switch, comprising:

(a) a casing formed in a hollow box shape with an open top;

(b) a plurality of fixed contacts disposed on an internal bottom surface of said casing;

(c) a plurality of terminals extending outside of said casing, each one of said terminals being electrically connected to one of said fixed contacts;

(d) a cover mounted to close said open top of said casing, said cover comprising a hole opposed to said fixed contacts;

(e) a slide member disposed inside said casing, comprising a control portion protruding out through said hole in said cover;

(f) a movable contact portion made of a resilient electrically conducting material which has at least one leg portion directed toward said internal bottom surface of said casing such that said movable contact portion is elastically loaded against said internal bottom surface of said casing to thereby produce a biasing force on said slide member to impel it in a direction toward said cover;

(g) said movable contact portion being slidable with said control portion of said slide member to selectively electrically connect said leg portion of said movable contact portion with said fixed contacts to connect a combination of said fixed contacts with each other;

(h) a seal member interposed between an internal side of said cover and a side of said slide member facing said internal side of said cover, said seal member being squeezed between said slide member and said cover to provide a seal between an inside of the casing and outside thereof, a periphery of said seal member being clamped between said cover and said casing.

4,628,167

APPARATUS FOR INDUCTIVELY HARDNEING THE INTERIOR SURFACE OF OBJECTS

William D. West, Warren, Mich., assignor to Tocco, Inc., Boaz, Ala.

Filed Jun. 27, 1985, Ser. No. 749,525

Int. Cl.[4] H05B *6/38*

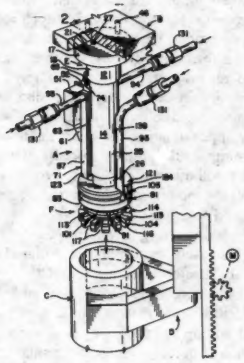
U.S. Cl. 219—10.57 **16 Claims**

1. An inductor and quench head apparatus for heat treating elongated bores of substantially uniform cross-sectional shape comprising:

a mandrel including a mounting base, an intermediate shaft portion, a downwardly facing surface and a pilot shaft portion of substantially constant cross-sectional shape;

an inductor module comprising:

an inductor coil, means supplying electrical current to said inductor coil, quench means dispensing quench fluid near said inductor coil and means supplying fluid to said



quench means, said inductor module having a central aperture slightly larger in cross-section than said pilot shaft portion and an upwardly facing surface;

said inductor module being releasably fixed to said mandrel by a first fastener means with said central aperture engaging said pilot shaft, and said upwardly facing surface engaging said downwardly facing surface.

4,628,168

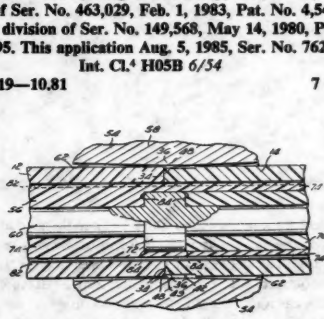
DIELECTRIC HEATING DEVICE FOR HEATING CANNULA MEMBERS

Perry A. Nebergall, Laguna Hills, and Robert C. French, El Toro, both of Calif., assignors to Shiley, Inc., Irvine, Calif.

Division of Ser. No. 463,029, Feb. 1, 1983, Pat. No. 4,547,641, which is a division of Ser. No. 149,568, May 14, 1980, Pat. No. 4,419,095. This application Aug. 5, 1985, Ser. No. 762,268

Int. Cl.[4] H05B *6/54*

U.S. Cl. 219—10.81 **7 Claims**



1. A dielectric heating device, comprising:

an annular outer electrode for generating a high frequency electrical current to heat the mated ends of a cannula member and a radiopaque tip, thereby joining said mated ends at a joint to form a unitary, integral cannula for insertion into the body of a patient, said outer electrode positioned over said cannula proximate said joint so that the interior surface of said outer electrode closely surrounds said cannula, said interior surface comprising:

a mid-section positioned generally adjacent said joint, the inner diameter of said mid-section closely approximating the outer diameter of said cannula providing means for

concentrating said heat at said joint and forming a substantially smooth exterior surface on said cannula; and

tapered end sections having gradually increasing inner diameters just slightly larger than said inner diameter of said mid-section for providing air vent means for permitting the escape of air from the vicinity of said joint and for preventing the burning of said cannula;

an elongate inner electrode inserted within said cannula so as to be generally opposite said outer electrode, said inner electrode having an enlarged section located generally at said joint for concentrating said heat at said joint;

insulation means encapsulating said inner electrode for (i) preventing said cannula from burning and (ii) forming an inner mandrel, the outer diameter of said inner mandrel closely approximating the inner diameter of said cannula for forming a substantially smooth interior surface on said cannula, said mandrel including groove means for venting air from the vicinity of said joint and preventing the burning of said cannula;

means for conducting high frequency electrical current through said electrodes and said mated ends of said cannula to heat said mated ends; and

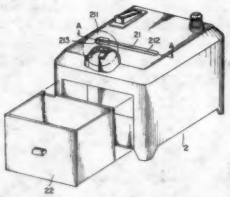
means for exerting an axial force on said tip for eliminating irregularities inthe mating surfaces of said cannula member and said tip and for fusing said mating surface together to form said unitary, integral cannula.

4,628,169

MINI ELECTRICAL SYRINGE NEEDLE DESTROYER

Hsieh Ch'ing-Lung, 113, 5th F., Section 5, Yen-Ping N. Road, Taipei, Taiwan

Filed Nov. 16, 1983, Ser. No. 552,324
Int. Cl.[4] B23H *9/00*; H05B *3/00*
U.S. Cl. 219—68 **1 Claim**



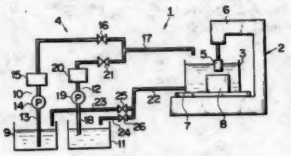
1. A destruction device for a flanged needle head attached to a syringe, the device including a casing having a top wall provided with a needle head insertion opening, electric circuit means associated with the casing including a pair of electrodes within the casing under the needle head insertion opening, the electrodes being mutually located for receiving a needle portion of a needle head inserted in the opening therebetween whereby a short circuit is created between the electrodes for melting the needle portion, and the casing further including separator means for disconnecting the needle head with melted needle portion from the syringe, and collector means into which the separated needle head falls, wherein the separator means comprises an elongate guide track in the top wall of the casing extending from the needle head insertion opening, the guide track having downwardly inclined side walls for receiving the needle head flange thereunder after melting of the needle portion whereby sliding of the needle head along the guide track effects separation of the needle head from the syringe.

4,628,170

EDM USING TWO SEPARATE DIELECTRIC FLUIDS AND A SYSTEM FOR MAINTAINING SEGREGATION OF THE FLUIDS

Toshihiko Furukawa, Yamato, Japan, assignor to Sodick Co., Ltd., Kanagawa, Japan

Filed Feb. 26, 1982, Ser. No. 352,975
Claims priority, application Japan, Mar. 17, 1981, 56-037314
Int. Cl.[4] B23H *1/10, 7/36*; B01D *17/025*
U.S. Cl. 219—69 D **10 Claims**



5. An apparatus for electric discharge machining in which electric discharge machining is carried out as a dielectric fluid is fed to a machining gap between a workpiece and a tool electrode, comprising:

a feed-oil system having an oil tank;

a feed-water system having a water tank;

a feeding means for selectively feeding water or oil as the dielectric fluid to said machining gap by selecting said feed-water system or said feed-oil system; and

means for returning the dielectric fluid used in said machining gap to the corresponding tank and

a dielectric fluid recovery device for separating and recovering the dielectric fluid, wherein said dielectric fluid recovery device comprises a separate tank for separating the oil and the water into an upper layer and a lower layer, a first feeding means for sending the fluid near the bottom of said dielectric fluid in said oil tank to said separating tank, a second feeding means for sending the fluid at near the surface of said dielectric fluid in said water tank to said separating tank, the second feeding means including an oil-removing device for removing the oil floating on the surface of the water in the water tank, and means for recovering the oil and the water by separation in said separating tank and returning them to said oil tank and said water tank respectively.

4,628,171

MECHANICAL FEED EDM MACHINE FOR MAKING THREADED AND NONTHREADED BORES

Lloyd E. Colby, and John E. Ingalls, both of Whitehall, Mich., assignors to Port City Machine & Tool Company, Muskegon Heights, Mich.

Filed Jan. 11, 1985, Ser. No. 690,534
Int. Cl.[4] B23H *1/00, 7/26*; B23G *1/16*
U.S. Cl. 219—69 G **19 Claims**

1. An electrical discharge machining device for producing variously sized, threaded apertures with corresponding, threaded cutting electrodes, comprising:

a normally stationary support member;

a carriage mounted on said support member for generally longitudinal translation therealong;

a drive shaft, having first and second ends, and being mounted on said carriage for generally axial rotation thereon;

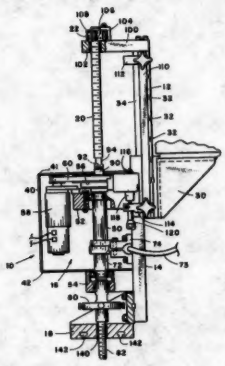
a motor mounted on said carriage, and operably coupled to said drive shaft for axially rotating said drive shaft;

a threaded lead screw for translating said carriage with respect to said stationary support member; said lead screw having first and second ends, with the first end of said lead screw removably and interchangeably coupled to the first end of said drive shaft; said lead screw having a predeter-

mined thread pitch corresponding to the pitch of the threaded aperture to be formed;

a lead screw guide removably and interchangeably mounted on said stationary support member, and having a threaded aperture therethrough in which said threaded lead screw is matingly received; said lead screw guide having a predetermined thread pitch corresponding to the pitch of the threaded aperture to be formed;

means for removably and interchangeably coupling a selected, corresponding one of a plurality of electrodes with one of said drive shaft second end, and said lead screw second end for rotation therewith, whereby rotation of



said motor both rotates the selected electrode and simultaneously translates the selected electrode longitudinally with respect to a corresponding electrically conductive workpiece for automatically regulating the rate of longitudinal movement of the selected electrode to insure accurately formed threads; and

means for applying electrical energy to the selected electrode, and being removably connected therewith, so that multiple pairs of lead screws and lead screw guides, having different thread pitches, can be easily removed and interchanged with said machining device to produce variously sized threaded apertures.

4,628,172

GAP ENERGIZING SYSTEM FOR TW ELECTROEROSION

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawa, Japan

Filed Sep. 21, 1984, Ser. No. 653,191

Claims priority, application Japan, Sep. 21, 1983, 58-173171; Sep. 21, 1983, 58-173172; Sep. 22, 1983, 58-174102; Apr. 9, 1984, 59-70581

Int. Cl.[4] B23H *7/04*

U.S. Cl. 219—69 W **8 Claims**

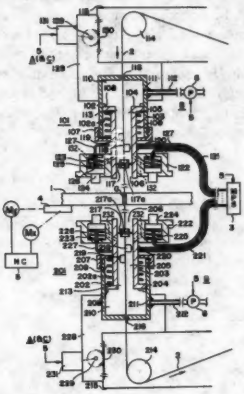
1. A gap energizing system for TW electroerosion, comprising:

a fluid delivery assembly having an internal fluid passage longitudinally traversed by a straight-line path for a traveling wire-like electrode traversing an electrically conductive workpiece while defining a machining gap therewith, said passage being supplied with a machining fluid from an external fluid source and ending with a nozzle outlet for discharging the supplied fluid as an envelop flow surrounding the electrode towards the workpiece and into said machining gap;

guide means disposed in said internal passage for holding the axis of the electrode traveling therethrough in alignment with said path;

first contact means disposed in said internal passage and maintained in contact with the traveling electrode therein for electrically energizing the same; and

second contact means movably mounted on said fluid delivery assembly so as to surround the electrode passing



through said nozzle outlet and operably arranged for movement parallel to said path towards the workpiece to make contact therewith for energizing the machining gap, only upon development of a fluid pressure in said passage representing delivery of the machining fluid into said gap.

4,628,173

FABRICATING MACHINE

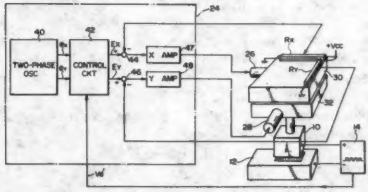
Tetsuro Ito, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 300,864, Sep. 10, 1981, Pat. No. 4,491,712. This application Nov. 16, 1984, Ser. No. 672,005

Claims priority, application Japan, Sep. 10, 1980, 55-125798; Sep. 17, 1980, 55-129868; Sep. 19, 1980, 55-130166; Sep. 19, 1980, 55-130167

Int. Cl.[4] B23H *7/28*

U.S. Cl. 219—69 G **7 Claims**



1. A discharge machining method for machining an electrically conductive workpiece by applying electric current to said workpiece and an electrode through a dielectric machining solution in the machining gap between said electrode and said workpiece, said method comprising the steps of:

moving an electrode and a workpiece relative to each other in a primary or main machining direction;

subsequently controlling the machining gap along a plane substantially perpendicular to the primary machining direction to maintain an electric discharge enabling state wherein discharge can properly take place;

finish machining said workpiece by moving said electrode relative to said workpiece substantially in a circular motion;

while continuing the circular motion of said electrode relative to said workpiece, changing a radius of the circular motion of said electrode at a first rate in a direction for reducing the machining gap between said electrode and said workpiece when a machining state between said electrode and workpiece is acceptable; and

while continuing the circular motion of said electrode relative to said workpiece, changing the radius of the circular motion of said electrode at a second rate, greater than said first rate in a direction for increasing the machining gap between said electrode and said workpiece when the machining state between said electrode and said workpiece becomes deteriorated.

4,628,174

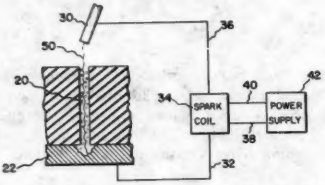
FORMING ELECTRICAL CONDUCTORS IN LONG MICRODIAMETER HOLES

Thomas R. Anthony, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 17, 1984, Ser. No. 651,014

Int. Cl.[4] B23K *28/00*

U.S. Cl. 219—76.13 **4 Claims**



1. A method of forming a through conductor in a small bore hole through a wafer having a length to diameter ratio in excess of six which comprises

disposing a vaporizable metal at the bottom of said hole,

disposing a thin electrode over the top of the hole, and

creating a spark between the metal and electrode to vaporize metal into and through said hole.

4,628,175

RESISTANCE WELDING EQUIPMENT HAVING AN OPTICAL ACCELEROMETER FOR MEASURING ELECTRODE ACCELERATION

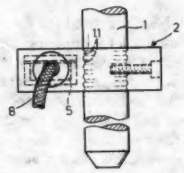
Norbert Nissl, Aresing, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 6, 1985, Ser. No. 698,699

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404692

Int. Cl.[4] B23K *11/24*

U.S. Cl. 219—110 **17 Claims**



1. In a resistance pressure welding device having an electrode, means for measuring the acceleration of said electrode, and means for controlling the welding current responsive to the measured acceleration, the improvement comprising:

said acceleration measuring means comprises at least one optical accelerometer, and

means clamping said optical accelerometer directly onto said electrode in a force-locking manner.

4,628,176

APPARATUS FOR SETTING SCHEDULES OF A RESISTANCE WELDING MACHINE

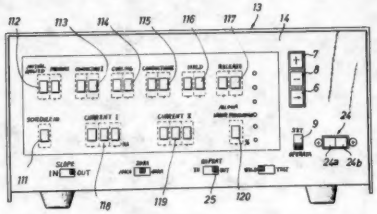
Koji Kojima, Tokyo, and Kiyosi Kajiwara, Saitama, both of Japan, assignors to Kabushiki Kaisha Tetrak, Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,624

Claims priority, application Japan, Sep. 19, 1984, 59-19638

Int. Cl.[4] B23K *11/24*

U.S. Cl. 219—110 **5 Claims**



1. Apparatus for entering program data for a programmable resistance welding machine, said apparatus having control means operatively connected to said machine for controlling the operation of the machine, said control means including a computer means having a memory for storing said program data, said apparatus comprising

(a) a numerical data entry keyboard consisting of a shift key for producing a first signal for designating selection of an item of program data to be entered, an incrementing key for producing a second signal for incrementing the numerical value of an item of program data, and a decrementing key for producing a third signal for decrementing the numerical value of an item of program data said apparatus having no other numerical data entry keyboards;

(b) said computer means comprising a microprocessor connected with said keyboard to receive said first, second and third signals, to sequentially designate each item of program data in said memory in response to said first signal, and to set a numerical value for each item of program data designated on the basis of said second and third signals; and

(c) a display unit connected to said keyboard and said computer means for displaying the numerical values of each item of program data.

4,628,177

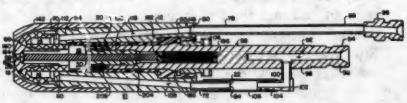
ARC WELDING TORCH

Will R. Dempsey, Owens Cross Roads, Ala.; Ernest O. Bayless, Petersburg, Tenn., and Samuel D. Clark, Huntsville, Ala., assignors to B & B Precision Machines, Inc., Owens Cross Roads, Ala.

Filed Aug. 10, 1984, Ser. No. 639,444

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121 PN **6 Claims**



1. A plasma arc welding torch assembly comprising:

an elongated, generally cylindrical, housing having an opening at one end;

a first annular chamber having an inlet coupled to receive a shield gas and an outlet, said outlet being concentric with said opening, and providing to said opening said shield gas;

a removable nosepiece sealably countersunk within said opening against said housing inboard of said first annular chamber, said nosepiece having a passageway therethrough and an orifice concentric with said opening;

a heat exchanger positioned adjacent to and heat conductively coupled to said nosepiece, said heat exchanger including a coolant chamber adjacent to and outboard of said nosepiece, and said coolant chamber being fluid coupled to a fluid inlet and outlet, whereby a cooling fluid may be circulated through said coolant chamber, cooling said heat exchanger and said nosepiece; and

electrode holding means for holding an electrode within said passageway adjacent said orifice, said electrode holding means comprising:

insulating means for electrically insulating said electrode from said housing and said nosepiece,

spring biasing means for biasing said electrode toward said orifice;

gripping means for selectively gripping said electrode and overcoming said bias to retain said electrode in a selected position with respect to said orifice,

electrical means for electrically biasing said electrode with respect to said nosepiece, and

electrode adjustment means, including a tubular member adapted to extend through said opening and around said electrode, for operating said gripping means and biasing said spring bias means to vary the longitudinal position of said electrode with respect to said orifice.

4,628,178

TOOL FOR WARM AND HOT FORGINGS AND PROCESS FOR MANUFACTURING THE SAME

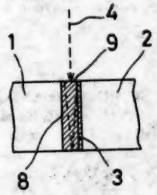
Masaya Miyake; Yasuhiro Saito, and Matsuo Higuchi, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 23, 1985, Ser. No. 737,397

Claims priority, application Japan, May 29, 1984, 59-110568; Oct. 23, 1984, 59-223785; Nov. 7, 1984, 59-234563; Feb. 4, 1985, 60-20230

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121 LD 12 Claims



1. A tool for warm and hot forgings manufactured by bonding cemented carbide to steel by use of high-energy beams, characterised in that said cemented carbide comprises a hard phase of tungsten carbide and 15-35% by weight of a binder metal phase, said binder metal phase comprising at least one selected from the group consisting of nickel, cobalt and iron, and at least one selected from the group consisting of chromium, molybdenum and tungsten forming a solid solution in said binder metal phase.

4,628,179

METHOD OF IMPROVING THE STATE OF THE SURFACE OF A ROLL

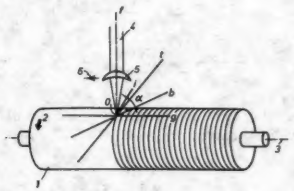
Jean R. Crahay, Francorchamps, Belgium, assignor to Centre de Recherches Metalurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Feb. 28, 1984, Ser. No. 584,394

Claims priority, application Luxembourg, Mar. 11, 1983, 84687

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121 LH 10 Claims



1. A method of forming an isotropic roughness in the form of a helical groove on the surface of a rolling mill roll comprising:

providing a substantially continuous corpuscular beam;

focusing said beam onto the outer peripheral surface of the roll;

rotating said roll about its longitudinal axis;

producing relative translational movement between said beam and said roll in the axial direction of the roll so that the area of impact of the beam on the surface of the roll traces a helical path on the surface of the roll;

adjusting the power of said beam at said impact area, the rotational speed of the roll and the speed of relative translational movement so that the beam produces a helical groove in the roll surface and the ratio of the pitch of the helical groove to the width of the beam at the area of impact is less than 1;

injecting a jet of gas in the impact zone of the beam on the roll surface; and

varying at least one of the parameters of said gas jet to modify the critical value of said pitch of the helical groove to ensure a predetermined depth of the groove, said parameters comprising direction, speed, pressure and flow rate of said gas jet.

4,628,180

WELDING SYSTEM FOR TIG WELDING

Heini Edberg, Kirkevej 15, 4930 Maribo, Denmark

PCT No. PCT/DK84/00049, § 371 Date Feb. 15, 1985, § 102(e) Date Feb. 15, 1985, PCT Pub. No. WO85/00024, PCT Pub. Date Jan. 3, 1985

PCT Filed May 25, 1984, Ser. No. 711,470

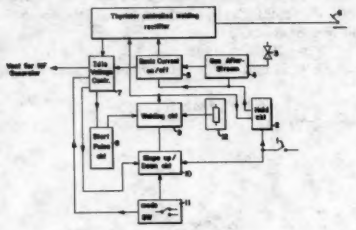
Claims priority, application Denmark, Jun. 15, 1983, 2742/83

Int. Cl.[4] B23K *9/06*

U.S. Cl. 219—124.01 4 Claims

1. Method of electronically controlling starting of TIG welding comprising the steps of: bringing a tungsten electrode into momentary contact with an object to be welded, then separating the electrode from said object to initiate an arc, providing a low short-circuit current at the contact and at the

separation of said contact the current is increased to a value above a predetermined welding current, and thereupon, after a



short period of time, the current is decreased to said predetermined welding current value at.

4,628,181

METHOD OF CONTROLLING THE OUTPUT CHARACTERISTIC OF A WELDING POWER SOURCE, APPARATUS FOR ARC WELDING, AND ELECTRICAL CIRCUIT TO BE USED FOR SUCH APPARATUS

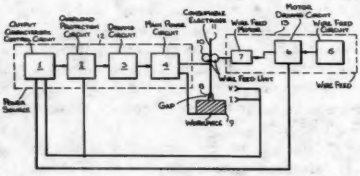
Jiluan Pan; Renhao Zhang; Zhiming Ou, and Zhiqion Wu, all of Tsinghua Yuan, Beijing, China

Filed Mar. 7, 1985, Ser. No. 709,388

Claims priority, application European Pat. Off., Jul. 5, 1984, 84107840.5

Int. Cl.[4] B23K *9/09*

U.S. Cl. 219—130.33 **16 Claims**



1. In a welding machine power supply connected to a welding electrode and a workpiece having an operating point including an output voltage and output current detected across the electrode and workpiece, a transfer circuit means for connecting together a plurality of output characteristic segments of the power supply having different slopes and lengths with substantially no overlap or mismatch of endpoints of adjacent segments and allowing movement of the operating point along the output characteristic segments so that the output current and output voltage values at the end of one segment are substantially equal to the operating current and voltage values on the adjacent segment to form a substantially continuous nonlinear output characteristic for conditions between open circuit voltage and short circuit voltage, comprising:

First feedback circuit to conduct when the sum of the output current and output voltage signals are greater than a first reference current;

Second feedback circuit to conduct when the output voltage is greater than a first reference voltage;

Third feedback circuit to conduct when the output current is greater than a second reference current;

Fourth feedback circuit to conduct when the output voltage is greater than a second reference voltage;

Fifth feedback circuit to conduct when the output current is greater than a third reference voltage;

First diode to block the operation of the first feedback circuit when the second or third feedback circuit is operating;

Second diode to block the operation of the second feedback circuit when the first feedback circuit is operating;

Third diode to block the operation of the third feedback circuit when the first or second feedback circuit is operating;

Fourth diode to block the operation of the fourth feedback circuit when the first, second, third or fifth feedback circuit is operating;

Fifth diode to block the operation of the fifth feedback circuit when the first, second, third or fourth feedback circuit is operating;

sixth diode connected to the output of the first, second, and third diodes to block the operation of the first, second, and third feedback circuits when the fourth or fifth feedback circuit is operating.

4,628,182

HOT-WIRE TIG WELDING APPARATUS

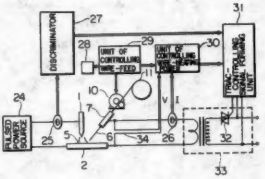
Katsuyoshi Hori; Eiji Watanabe; Toshiharu Myoga; Toshiaki Takuwa, and Kazuki Kusano, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1985, Ser. No. 751,134

Claims priority, application Japan, Jul. 2, 1984, 59-135071

Int. Cl.[4] B23K *9/09*

U.S. Cl. 219—130.51 **7 Claims**



1. A hot wire TIG welding apparatus having, in combination, pulsed arc TIG welding power supply means and wire heating power supply means, said TIG welding apparatus comprising:

(a) means for detecting the pulsed arc current;

(b) a discriminating means which discriminates, upon receipt of a signal from said detecting means, the peak current and the base current of said pulsed arc current; and

(c) a controller which controls, in response to a signal from said discriminating means, the operation of said wire heating power supply in such a manner that the supply of heating power to the wire is conducted only during a base period in which said arc current is formed only by said base current.

4,628,183

HEATING-FIXING ROLLER AND FIXING DEVICE HAVING THE SAME

Hiroshi Satomura, Saitama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1984, Ser. No. 681,676

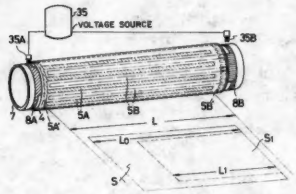
Claims priority, application Japan, Dec. 19, 1983, 58-237838

Int. Cl.[4] G03G *15/20;* **H05B** *3/10*

U.S. Cl. 219—216 **26 Claims**

1. A heating-fixing roller having over an axial direction thereof a heat-generating layer formed through the step of mixing a raw material capable of obtaining a positive temperature coefficient of resistivity characteristic by sintering and a binder for holding said raw material and forming an unsintered annular substrate and the step of providing an electrode to which an applied voltage is supplied on said mixture during said forming step, and thereafter through the step of sintering

said unsintered annular substrate on which said electrode is formed, said heat-generating layer having a positive temperature coefficient of resistivity characteristic after said sintering and having said electrode formed on the surface thereof.

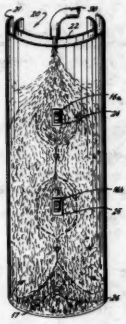


4,628,184

FOAM INSULATED WATER HEATER AND METHOD OF MAKING SAME

Eugene L. West, Grand Rapids, Mich., assignor to Bradford-White Corporation, Philadelphia, Pa.

Filed Mar. 26, 1985, Ser. No. 716,024
Int. Cl.[4] F24H *1/18*
U.S. Cl. 219—312 **20 Claims**



1. In a water heater comprising a water tank having a component intended to be kept substantially free from contact with an expandable foam insulating material and a jacket surrounding the tank and providing an insulating space therebetween, a pair of flexible sheets forming an apron, the sheets being joined to form a seal protecting said component from contact with the foam, the apron being positioned over a part of the tank surface in a position whereby the seal surrounds said component, the apron being substantially unsealed along its top and sides wherein the foam introduced between the sheets flows out of the unsealed sides of the apron to fill said space.

4,628,185

TOASTER OVEN AND PROTECTIVE HOOD

Richard L. Norwood, Waterbury; Charles Z. Krasznai, Trumbull; Roman Czernik, Trumbull, and Olle E. Haggstrom, Trumbull, all of Conn., assignors to Black & Decker, Inc., Newark, Del.

Filed Aug. 5, 1985, Ser. No. 762,425
Int. Cl.[4] H05B *3/06*; A47F *5/08*; F24C *7/00*
U.S. Cl. 219—386 **7 Claims**

1. An electric toaster oven and a protective hood for installing an electric toaster oven under a kitchen cabinet comprising;

a. an electric toaster oven including a generally horizontal top wall, generally vertical side walls, a generally vertical rear wall and a front opening to provide access to the inside of the toaster oven;

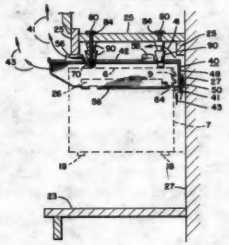
b. each of said side walls including an outwardly extending generally horizontal handle projection;

c. a protective hood for mounting the toaster oven including a top generally horizontal wall, an integrally formed depending rear wall, and downwardly extending vertical side walls;

d. means for securing the hood;

e. means for spacing the hood to provide cooling air flow over the top of the hood;

f. an inwardly extending flange formed on each of the vertical side walls of said hood for slidable engagement with the horizontal handle projections of said toaster oven;



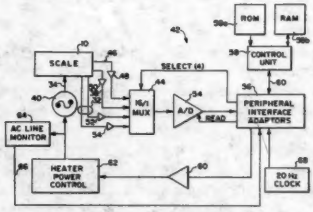
g. means formed on each of said handle projections of the toaster oven for cooperating with means formed on each of said inwardly extending flanges of said hood for spacing the rear wall of the toaster oven at least one-half inch from the rear wall of the hood and for spacing the top of the toaster oven at least onehalf inch from the top wall of the protective hood to provide cooling air flow upwardly between the rear wall of the hood and the rear wall of the toaster oven and then forwardly between the top wall of the hood and the top wall of the toaster oven where it can be vented in front of the hood.

4,628,186

HEATER-SCALE FOR HEATING FLUIDS FOR INJECTION INTO A PATIENT

David Bergemann, Vernon Hills; Alan A. Figler, Algonquin; Rene Lamadrid, Lake Forest; Stanley Pernic, Round Lake, and John J. Selman, Vernon Hills, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 30, 1984, Ser. No. 676,766
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—497 **15 Claims**



1. A heat-scale comprising:

means for supporting a selected contained volume of fluid to be weighed and heated including a first generally horizontal concave supporting surface for receiving the contained volume of fluid with said heating means affixed to a second, spaced apart, surface thereof and including tempera-

ture sensing means extending through said first and second surfaces toward the contained volume so as to be in contact with the contained volume of fluid;

distributed means affixed to a selected surface of said supporting means for evenly heating the volume of fluid in response to an electrical signal applied thereto;

means for sensing the temperature of the contained volume of fluid and for comparing the sensed temperature to a predetermined temperature;

means for switching the electrical signal to said heating means on and off for selected, time intervals which vary nonlinearly with respect to the comparison between the sensed temperature and the predetermined temperature to evenly heat the contained volume of fluid to said predetermined temperature without overshoot and to maintain said volume at the predetermined temperature;

means for comparing an electrical signal corresponding to a sensed initial weight of the contained volume of fluid to a first predetermined threshold and for enabling said switching means provided said sensed initial weight exceeds said first threshold; and

means for continuously monitoring said electrical signal applied to said heating means and for interrupting said switching on of said signal in response to sensing a selected condition.

4,628,187

PLANAR RESISTANCE HEATING ELEMENT

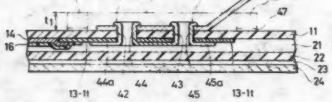
Tsugio Sekiguchi, Machida; Noboru Sato, Hachioji; Hiroki Igarashi, Hatano; Akiyoshi Ozawa, Zama, and Iemi Nakazawa, Sagamihara, all of Japan, assignors to Tokyo Cosmos Electric Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1985, Ser. No. 699,535

Claims priority, application Japan, Mar. 2, 1984, 59-31049[U]

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—505 **14 Claims**



1. A planar resistance heating element comprising:

(a) an insulating substrate;

(b) at least two electrodes disposed on a surface of said insulating substrate in spaced substantially parallel relation to each other;

(c) a resistive body layer disposed between said electrodes and having a positive temperature coefficient, said resistive body layer being composed of a crystalline resin with electrically conductive particles dispersed therein;

(d) a phenolic resin layer covering an entire surface of said resistive body layer;

(e) an adhesive layer disposed on said phenolic resin layer and extending to a peripheral edge of said insulating substrate; and

(f) an insulating protective film disposed on said adhesive layer in covering relation to an entire surface thereof.

4,628,188

ELECTRIC HEATING PAD FOR SEATS AND BACK-RESTS

Jan Andreasson, Mullsjö , Sweden, assignor to AB Mekania-Verken, Mullajo, Sweden

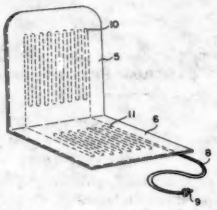
PCT No. PCT/SE84/00150, § 371 Date Dec. 20, 1984, § 102(e) Date Dec. 20, 1984, PCT Pub. No. WO84/04440, PCT Pub. Date Nov. 8, 1984

PCT Filed Apr. 19, 1984, Ser. No. 692,888

Claims priority, application Sweden, May 4, 1983, 8302536

Int. Cl.[4] H05B *3/34*

U.S. Cl. 219—528 **5 Claims**



1. In a heating pad for seats in vehicles, and the like, having a heated seating surface and back-rest to provide heat to a user's back and seat area, comprising, in combination:

(a) seat cushion means for covering a seat section and a back rest of a seat to be heated, and including a bottom part and an overlying top part each comprising a back portion and a seat portion and constructed of a relatively soft material having a conductivity which varies as a function of compression of the material, the back rest normally storing more heat than the seat section;

(b) electrical resistance seat section heater means disposed between the seat portion of the top part and the seat portion of the bottom part of the seat cushion means;

(c) electrical resistance back-rest heater means disposed between the back portion of the top part and the back portion of the bottom part of the seat cushion means, each of the heater means being electrically connected in series to the other of the heater means and selectively connectible to a voltage source;

the improvement wherein the electrical resistance seat section heater means comprises a first resistance wire section having a variation in resistance thereof which is directly proportional to temperature over a range of temperatures to which the first wire section is subjected and the electrical resistance back-rest heater means comprises a second resistance wire section having a substantially constant resistance over a range of temperatures to which the second wire section is subjected in order to reduce the amount of energy stored in the back rest.

4,628,189

ELECTRIC RESISTANCE HEATER

Michael Danko, Bland County, Va., assignor to Emerson Electric Co., St. Louis, Mo.

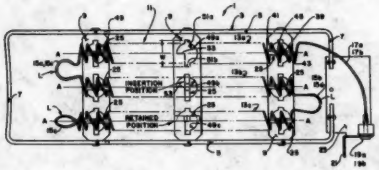
Filed Feb. 11, 1985, Ser. No. 700,116

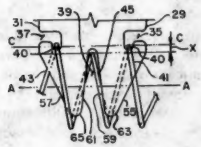
Int. Cl.[4] H05B *3/06*

U.S. Cl. 219—532 **6 Claims**

1. In an electrical resistance heater having an elongate wire heating element of generally helical coil construction, said coil having a coil axis and a plurality of convolutions spaced at substantially equal intervals along said coil axis, said heater having a frame and a plurality of electrical insulators supporting said heating element on said frame, wherein the improvement comprises: each of said insulators having a unitary body of a suitable electrical insulative material, said body having a first and a second side facing in generally opposite direction,

means for mounting said insulator body with respect to said frame such that said first and second sides of said insulator body are generally in line with said coil axis, said insulator body having a side notch in each of its said first and second sides, each of said side notches extending generally inwardly toward the center of said insulator body and having in inner end, at least a portion of said first and second sides of said insulator body being substantially planar and spaced outwardly with respect to said frame from said mounting means and angling inwardly so as to constitute a pair of planar, angled outer faces converging toward one another, said insulator body having an outer end between said angled outer faces, said outer end having a pair of inwardly converging, planar center notch faces defining a center notch extending inwardly toward said mounting means, means for wedgingly expanding said coil upon installation of said coil on said insulator, this last said means comprising a pair of body end portions or tips between the outer ends of each of said planar, angled outer faces and the outer end of its adjacent said planar center notch face with the distance between said center notch and each of said tips being less than the axial spacing of said convolutions along said coil axis when said coil is substantially unstretched so as to permit said insulator body and said coil to be assembled by disposing said insulator body relative to said coil with said first and





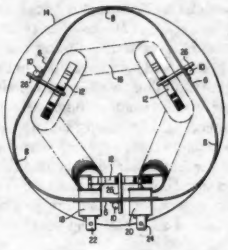
second sides of said insulator body facing in opposite directions with respect to said coil axis, with one convolution of said coil substantially in register with said center notch, and with adjacent convolutions of said coil on opposite sides of said one convolution being disposed for wedging engagement by respective said planar angled outer faces of said insulator body such that said one convolution is received within said center notch and such that each of said tips is disposed between said one convolution and a next adjacent convolution so that said next adjacent convolutions are wedgingly spread outwardly away from said one convolution by engagement with a respective said planar angled outer face until said next adjacent convolutions are in register with and are received in said side notches, and means for positively retaining said coil in position on said insulator including said center notch having a base which is offset relative to said coil axis with respect to a line established by the inner ends of said side notches, and further including each of said side notches having a first or entry portion extending generally inwardly of the insulator from the respective first or second side thereof and a second or end portion at an angle with respect to said entry portion and extending toward said outer end of said insulator thereby defining a retaining shoulder between said entry and end portion of said slot so as to positively prevent said coil convolutions received in said side slots from exiting said side slots.

4,628,190

DUCT HEATER

Jimmy L. Sherrill, Cookeville, Tenn., assignor to Tutco, Inc., Cookeville, Tenn.

Filed Oct. 10, 1984, Ser. No. 659,454
Int. Cl.⁴ H05B 3/06
U.S. Cl. 219—532 **5 Claims**



1. Electrical heater support apparatus for insertion into a duct comprising

a first bracket means,

a second bracket means spaced from said first bracket means,

frame bar means attached to said first and second bracket means for maintaining said first and second bracket means in a fixed relationship with each other,

insulating support means attached to said frame bar means for engaging and supporting a heater element having electrical terminals,

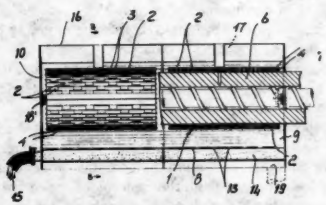
wherein each of said first and second brackets comprises a thin strip formed into a geometric shape and having a plurality of flexible portions forming corners and a plurality of sections intermediate adjacent corners, said frame bar means being attached to each of said first and second bracket means at at least one of said intermediate sections, and wherein each of said plurality of corners lies on a common geometric curve and each of said sections lies within said curve whereby said apparatus may be inserted into a duct having a cross-section in the form of said curve and said apparatus will engage said duct only at said plurality of corners.

4,628,191

ELECTRIC THERMAL UNIT

Gaetano Piazzola, Via Borri, 148, 21100 - Varese, Italy

Filed Mar. 12, 1984, Ser. No. 588,678
Claims priority, application Italy, Mar. 17, 1983, 20130 A/83
Int. Cl.⁴ H05B 3/58
U.S. Cl. 219—535 **1 Claim**



1. An electric thermal unit for heating an extruder cylinder (6) in extruders, injection presses and drawing machines, comprising an outer casing (16) a plurality of shaped strips (2) positioned within said casing, said strips being mutually coupled to define a substantially annular structure effective to

encompass an extruder cylinder and to be supported thereby, said strips including substantially continuous holes (3) housing a heating spiral coil resistance element (4) to be supplied by an outside electric power source, an insulating material layer (8) substantially concentrically arranged around said strips and having an outer surface and a grooved and reflective inner surface (11) which defines with said strips a first inner interspace (9), said outer casing encompassing said insulating material layer and defining with said outer surface of said layer a second outer interspace (17), end discs (10) for supporting said insulating material layer and said outer casing, said outer casing having a bottom and being provided at said bottom with an opening (19) for coupling to a ventilating air source, whereby ventilating air is conveyed through said opening into said second interspace, said insulating material layer having a top and being so arranged as to define, at said top a slot (12) for allowing said ventilating air to enter said first interspace to be heated by said spiral coil heating resistance element, and, at the bottom of said material layer a plurality of openings (13) to be coupled to a heated air recovering duct.

4,628,192

CASH HANDLING MACHINE

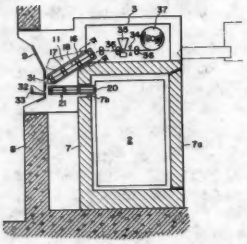
Tadao Suzuki, Ashiya, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 14, 1985, Ser. No. 797,944

Claims priority, application Japan, Nov. 19, 1984, 59-175971[U]

Int. Cl.⁴ G07G *5/00*

U.S. Cl. 235—1 R **3 Claims**



1. A cash handling machine comprising:

(a) a cash containing device housed within a safe and formed with a cash container inlet or outlet;

(b) a receipt printer mounted on the safe movably backward for printing transaction data on a receipt;

(c) an operation panel disposed in front of the safe and the receipt printer and formed with a cash inlet or outlet and a receipt outlet;

(d) cash carrying means for carrying cash discharged from the cash containing device at the cash container outlet to the cash outlet formed in the operation panel or for carrying cash charged from the cash inlet formed in the operation panel to the cash container inlet of the cash containing device; and

(e) receipt carrying means for carrying a receipt on which predetermined data are printed by the receipt printer to the receipt outlet formed in the operation panel, said receipt carrying means being pivotally supported by the receipt printer at one end thereof.

4,628,193

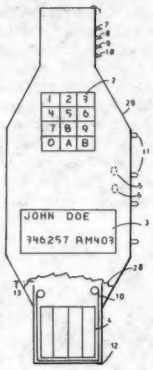
CODE READING OPERATIONS SUPERVISOR

Alvin S. Blum, 2350 Del Mar Pl., Fort Lauderdale, Fla. 33301

Filed Jan. 30, 1980, Ser. No. 116,678

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 235—375 **11 Claims**



1. Portable apparatus for controlling, supervising, and recording operations by an operator which require,

1. operator travel to multiple sites remote from personal supervision,

2. correct operator identification at said sites of unique elements, bearing machine readable identifying codes, from the group including items on lists, persons, sites, packages, pharmaceutical containers and the like, and

3. correct treatment of said elements by said operator at said sites on the basis of said identifications, comprising:

a. reading means for reading said machine readable identifying code data;

b. input/output means for communicating data with external data processing and storage means;

c. manual input means and output means for communicating with said operator;

d. data storage means interconnected to means (a), (b) and (c) for storing data transmitted therethrough.

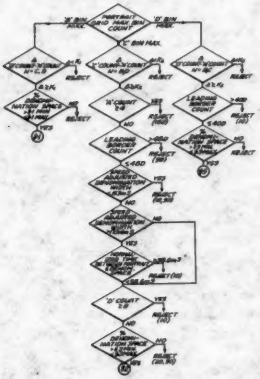
e. data processing means interconnected to said data storage means to ascertain by data processes operant upon said stored data that a particular one of said identified elements at said remote site has been correctly associated with at least one other of said identified elements as required for said correct treatment;

f. signal means connected to said data processing means to signal to said operator by a first signal when said data processing means has ascertained that a correct association of said elements has been made, and to signal by a second, different signal when an incorrect association has been made, said storage means storing data from said external data processing and storage means relating codes of elements which must be associated for said correct treatment, and said elements which must be associated for said correct treatment bearing identifying codes which are not identical to prevent said operator from defeating the system integrity by reading one of said identifying codes twice.

4,628,194
METHOD AND APPARATUS FOR CURRENCY VALIDATION

Bob M. Dobbins, Phoenixville, and Elwood E. Barnes, Parkesburg, both of Pa., assignors to Mars, Inc., McLean, Va.

Filed Oct. 10, 1984, Ser. No. 659,411
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 **52 Claims**



1. A method for determining the authenticity and denomination of paper currency, said currency having a plurality of distinct areas each containing currency identifying characteristics, said method comprising the steps of:

scanning one of said areas with an electrical signal generating sensor and thereby generating a sequence of electrical signals in response to the currency identifying characteristics detected by the sensor in the area scanned,

measuring the intervals between the generated signals,

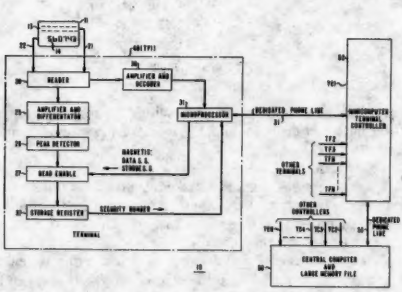
classifying each of the measured intervals into one of a plurality of sets, the classification of each of the measured intervals being dependent upon the length of that interval, and

determining the difference between the number of intervals in one of said sets and the number of intervals in another of said sets.

4,628,195
CREDIT CARD SECURITY SYSTEM

Rene Baus, Rancho Palos Verdes, Calif., assignor to American Magnetics Corporation, Carson, Calif.

Filed Mar. 9, 1984, Ser. No. 588,048
Int. Cl.[4] G06K *7/00*
U.S. Cl. 235—440 **12 Claims**



1. a credit card security system for a card bearing data embodies in first and second forms on first and second tracks respectively, such system comprising:

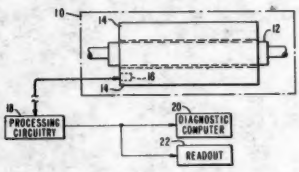
reader means for simultaneously sensing said data in said first and second forms, wherein said first and second forms are magnetic representations on a magnetic stripe and embossed representations respectively, and for producing first and second signal trains representative of said data in said first and second forms respectively, so that the first and second signal trains have a unique phase relationship therebetween characteristic of the physical location of the data embodies in said card; and

means responsive to said first and second signal trains for generating a code representative of said characteristic phase relationship.

4,628,196
TEMPERATURE MEASURING APPARATUS

Michael Twerdochlib, Oviedo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 4, 1985, Ser. No. 772,587
Int. Cl.[4] G02F *1/01*; G01K *11/14*
U.S. Cl. 250—225 **9 Claims**



1. Apparatus for determining temperature, comprising:

(A) a temperature sensing element having a portion which rotates as a function of the temperature to which the element is exposed;

(B) a first polarizing filter coupled to said portion for rotation therewith;

(C) a first light detector;

(D) a light source;

(E) optical fiber means positioned to convey light from said source to said first polarizing filter and to said first light detector;

(F) a rotatable, second polarizing filter interposed between said first light detector and the end of said optical fiber means conveying said light to said first light detector;

(G) a second light detector;

(H) means for projecting a reference light onto said second detector;

(I) a manually rotatable polarizing filter;

(J) said manually rotatable polarizing filter and said second polarizing filter being interposed in the light path between said means for projecting and said second detector;

(K) means for continuously rotating said second polarizing filter so that each said detector provides respective AC signals;

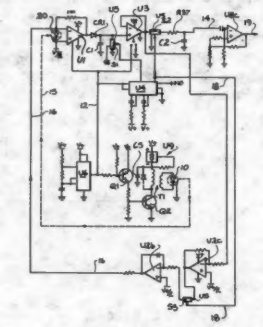
(L) means for comparing the phase difference between said AC signals; and

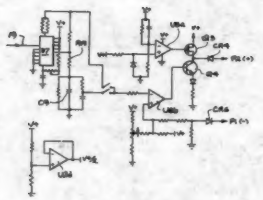
(M) means for converting said phase difference to an equivalent temperature signal.

4,628,197
ELECTRONICS FOR FIBER OPTIC VORTEX SHEDDING FLOW METER

William L. Thompson, Montville, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed May 21, 1984, Ser. No. 612,284
Int. Cl.[4] H01J *5/16, 40/14*
U.S. Cl. 250—227 8 Claims



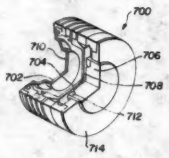


1. An optical sensor arrangement comprising:
light-emitting means;
light-detecting means;
light-connection means connected between said light-emitting means and said light-detecting means for varying an attenuation of light from said light-emitting means to said light-detecting means according to a variable to be measured;
pulse generator means connected to said lightemitting means for applying low-duty cycle, high-current pulses to said light-emitting means for generating lowduty cycle light pulses which are transmitted to said light-detecting means for generating detected pulses;
sample and hold means having an input connected to said light-detecting means for sampling said detected pulses and for holding a peak value for each pulse at an output of said sample and hold means;
feedback means connected between said input and said output of said sample and hold means for returning a signal to said input immediately after each low duty cycle high current pulse of said pulse generator means to suppress said detected pulses after each low-duty cycle, high-current pulse; and
square wave generator means connected to said sample and hold means for forming a square wave signal corresponding to the variable to be measured.

4,628,198
IMAGE INTENSIFIER WITH AN ELECTROPHORETIC GETTER DEVICE

Ettore Giorgi, Milan, Italy, assignor to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Mar. 8, 1985, Ser. No. 709,641
Claims priority, application Italy, Mar. 16, 1984, 20097 A/84
Int. Cl.[4] H01J *31/50*
U.S. Cl. 250—213 VT 8 Claims

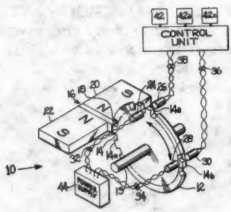


1. An image intensifier comprising:
A. an input window having an external face and an internal face;
B. a photocathode on the internal face of the input window;
C. an output window juxtaposed from the input window, said output window having an internal face and an external face;
D. a phosphor screen adjacent the internal face of the output window;
E. a microchannel plate interposed between the input window and the output window; and
F. a getter device within said image intensifier said getter device comprising a getter support, said getter support having thereon an electrophoretic deposition of at least one member selected from the group consisting of Zr-Al-Fe alloys, Zr-Ni alloys, Zr-Fe alloys, Zr-Ti-Fe alloys, Zr-M_1-M_2 alloys wherein M_1 is vanadium or niobium and M_2 is nickel or iron, Zr, Ta, Hf, Ni, Ti, Th, V and hydrides thereof.

4,628,199
ROTARY NOISELESS DETENT SWITCH

Michael M. Mueller, 7925 S. W. 11th Ave., Portland, Oreg. 97219, and Thomas D. Gonzales, 8810 S. W. Alden St., Portland, Oreg. 97223

Filed Oct. 13, 1983, Ser. No. 541,697
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—229 9 Claims



1. A noiseless magnetic detent switch for making interconnection between circuits, and having a rest position, comprising:
a. a magnetic pole piece;
b. a ferromagnetic member movably mounted with respect to said pole piece, said member having a first edge and a second edge and being in close proximity to said pole piece in said rest position;
c. detection means for detecting said first edge when said member is moved in one direction from said rest position and for detecting said second edge when said member is moved in the opposite direction to said one direction from said rest position; and

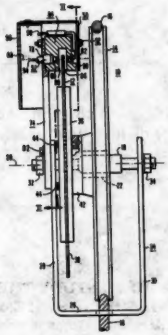
d. means for making said interconnection in response to said detection of said first edge and for disconnecting said interconnection in response to said detection of said second edge.

4,628,200

PULSE WHEEL SYSTEM WITH SHAFT MOUNTING

Pantelis G. Tinios, Mt. Arlington, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 20, 1984, Ser. No. 642,906
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—231 SE 1 Claim



1. A pulse wheel system for developing at least first and second pulse trains having a predetermined phase shift between them, comprising:

a pulse wheel including a rotational axis, and a series of perimetrically spaced discontinuities,

a shaft having a longitudinal axis,

a rotatable element journaled for rotation about said shaft,

means mounting said pulse wheel for rotation with said rotatable element, coaxial with said shaft,

mounting plate mounted on said shaft,

and first and second detector means having predetermined center lines, said first and second detector means being mounted on said mounting plate to detect the discontinuities of said pulse wheel and provide first and second pulse trains in response thereto,

said mounting plate having an opening for receiving said shaft and openings for orienting the center lines of said first and second detector means relative to the longitudinal axis of said shaft, with said mounting plate being devoid of means for changing the dimensional between its openings,

with the center of the openings which orient the center lines of the first and second detector means being located a like distance from the longitudinal axis of the shaft, spaced apart on the periphery of a circle whose center coincides with the longitudinal axis of the shaft, and with the spacing between the center of the openings being selected to provide the predetermined phase shift between the first and second pulse trains,

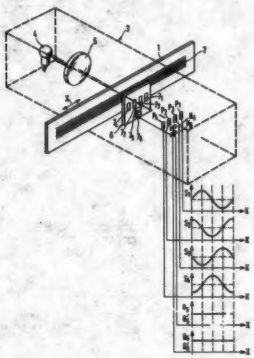
and wherein the series of perimetrically spaced discontinuities include teeth having a width T spaced by a dimension N, each detector means includes a beam of electromagnetic radiation having a diameter D, with the pulse wheel system providing pulse trains having a resolution R, and wherein the width T is equal to $\frac{1}{2}R+2D$ and the width N is equal to $\frac{1}{2}R-2D$, to provide pulse trains having equal on and off times.

4,628,201

SCANNING SIGNAL BALANCING CIRCUIT

Walter Schmitt, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,768
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307931
Int. Cl.[4] A45B 3/08; H01J 40/14
U.S. Cl. 250—237 G 13 Claims



1. In a digital position measuring system of the type comprising a measuring scale, a scanning unit including at least one scanning element positioned to scan the scale and to generate in response thereto a scanning signal, and an evaluating circuit coupled to the at least one scanning element to evaluate the scanning signal, the improvement comprising:

a balancing circuit coupled to the measuring system and comprising:

at least one bridge circuit; and

at least one balancing element for balancing at least one signal parameter of the scanning signal, said balancing element included in the bridge circuit;

said bridge circuit defining a first pair of diagonal nodes circuited parallel to the at least one scanning element in the scanning unit.

4,628,202

METHOD AND APPARATUS FOR GAMMA RAY WELL LOGGING

Daniel C. Minette, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 485,150, Apr. 15, 1983. This application May 21, 1985, Ser. No. 736,589
Int. Cl.[4] G01V 5/12
U.S. Cl. 250—269 12 Claims

1. A method of investigating a subsurface earth formation traversed by a borehole comprising:

introducing a first plurality of photons into said formation;

detecting a second plurality of photons emanating from said formation;

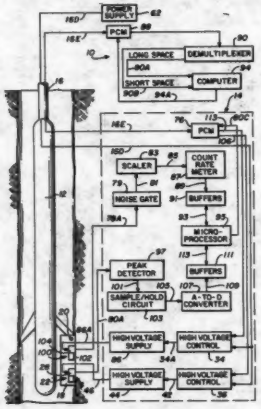
generating electrical signals in said borehole for all said detected photons, each electrical signal representing the energy of a respective different photon in said second plurality of photons, wherein said energy is substantially within the range of 60 to 660 KeV comprising said second plurality of photons emanating from said formation into said borehole;

delivering all of said electrical signals to the surface;

establishing a plurality of preselected energy ranges, each said range corresponding to a different amplitude range of said electrical signals;

deriving a plurality of count rates, each count rate being for a different one of said energy ranges and each said count rate corresponding to the number of said electrical signals occurring per unit of time within said corresponding amplitude range;

deriving a first function f(SH,ρ) of SH and ρ from a model of subsurface formations;



deriving a first soft-to-hard ratio from said count rates; and

determining a first photoelectric cross-section from said soft-to-hard ratio and said first function, where f is said function; where

S and H are count rates of low and high energy gamma rays in said formation, respectively; and

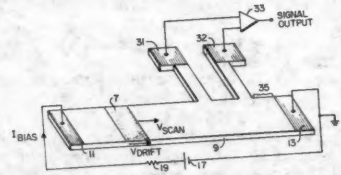
ρ is the density of said formation.

4,628,203

NON-DELINEATED DETECTOR HAVING A DIFFERENTIAL READOUT

Marion B. Reine, Wellesley, and Ronald R. Kusner, Concord, both of Mass., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Jan. 14, 1985, Ser. No. 690,908
Int. Cl.[4] G01L *31/08*
U.S. Cl. 250—334 **5 Claims**



1. In a thermal radiation imaging system comprising detector means and scanning means for scanning a thermal radiation image across said detector means, a radiation detector comprising:

an elongated strip of semiconductor material which is photoconductive by the generation of electron and hole photocarriers when said radiation image is scanned along said strip, said strip having first and second ends;

a first contact at said first end and a second contact at said second end;

means for applying lengthwise through said strip, between said first contact and said second contact, a bias electric current producing an ambipolar drift of photocarriers in said strip whose velocity and direction of drift substantially match respectively the velocity and direction of scanning of said strip;

first and second readout electrodes connected to said strip near said second end of said strip, said strip having an active length and said readout electrodes having a separation such that minority photocarriers in said drift reach said separation between said readout electrodes in a time less than the average electron hole recombination time of said semiconductor material; and wherein

said first and second readout electrodes are spaced from said second contact such that the readout electrode nearest said second contact is located a distance from said second contact which is no less than the upstream diffusion length (L_u) of said detector, wherein L_u is defined by the relationship

$$\frac{1}{L_u} = \frac{\sqrt{\delta^2 + 1} - \delta}{L_a}$$

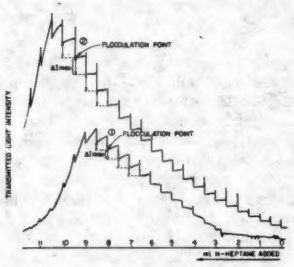
where L_a is the ambipolar diffusion length and δ is the drift velocity (V_{drift}) divided by τ, where τ, is the minority carrier lifetime.

4,628,204

OPTICAL METHOD TO STUDY THE STABILITY OF COLLOIDAL SYSTEMS

Jean Pierre Maes, Merebeke, Belgium, assignor to S.A. Texaco Belgium N.V., Brussels, Belgium

Filed Aug. 16, 1984, Ser. No. 641,228
Int. Cl.[4] G01N *21/27*
U.S. Cl. 250—343 **14 Claims**



1. Apparatus for continuously determining the ratio of diluent to colloidal fluid at which flocculation occurs in a mixture of said diluent and said fluid comprising in combination

a conduit for said fluid,

means for causing said fluid to flow through said conduit at a predetermined rate,

means for adding said diluent at a measured incremental rate to said fluid at each of a plurality of successive positions along said conduit to make successive trial mixtures of said diluent and fluid,

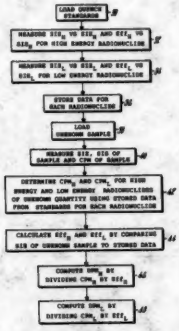
monitor means located downstream of each said diluent-adding position along said conduit for generating an electrical signal indicative of the ability of each said trial mixture of diluent and fluid to transmit radiation, and

means for collecting said electrical signals and automatically computing therefrom the ratio of diluent to colloidal fluid at which flocculation occurs in a mixture of said diluent and said fluid.

4,628,205
REGIONLESS MULTIPLE LABEL SCINTILLATION COUNTING

Gustav C. van Cauter, Batavia; Leroy J. Everett, Glen Ellyn, and Stanley J. DeFilippis, Naperville, all of Ill., assignors to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed Apr. 8, 1985, Ser. No. 721,264
Int. Cl.[4] G01T *1/20*
U.S. Cl. 250—361 R **17 Claims**


LOAD COUNTER STANDARDS
MEASURE SIE_1 VS SIE_2 AND EFF_1 VS SIE_1 FOR HIGH ENERGY RADIONUCLIDE
MEASURE SIE_1 VS SIE_2 AND EFF_1 VS SIE_1 FOR LOW ENERGY RADIONUCLIDE
STORE DATA FOR EACH RADIONUCLIDE
LOAD UNKNOWN SAMPLE
MEASURE SIE_1, SIE_2 OF SAMPLE AND CPM_1 OF SAMPLE
DETERMINE CPM_1 AND CPM_2 FOR HIGH ENERGY AND LOW ENERGY RADIONUCLIDES OF UNKNOWN QUANTITY USING STORED DATA FROM STANDARDS FOR EACH RADIONUCLIDE
CALCULATE EFF_1 AND EFF_2 BY COMPARING SIE_2 OF UNKNOWN SAMPLE TO STORED DATA
COMPUTE DPM_1 BY DIVIDING CPM_1 BY EFF_1
COMPUTE DPM_2 BY DIVIDING CPM_2 BY EFF_2

10. A regionless method for ascertaining the unknown quantity of multiple known radioactive nuclides in a test sample which comprises the steps of:

establishing a first set of correlation curves between a first quench-indicating parameter and a second quench-indicating parameter for each of the known radionuclides;

storing a second set of correlation curves between the second quench-indicating parameter and efficiency for each of the known radionuclides;

determining a second quench-indicating parameter and a count rate for the test sample;

comparing the second quench-indicating parameter of the test sample to the first set of correlation curves to determine the relative proportions that each radionuclide contributes to the count rate for the test sample;

ascertaining the efficiency for each radionuclide by comparing the measured second quench-indicating parameter of the sample to the second set of correlation curves; and

calculating the unknown quantity of each radionuclide by dividing the proportional count rate for the radionuclide by the efficiency value for the radionuclide from the step of ascertaining.

4,628,206
VISIBLE-UV HORIZON SENSOR

Robert W. Astheimer, Westport, Conn., assignor to Barnes Engineering Company, Stamford, Conn.

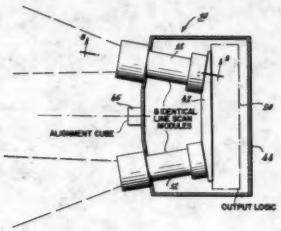
Filed Aug. 27, 1984, Ser. No. 644,549
Int. Cl.[4] G01J *1/42*
U.S. Cl. 250—372 **7 Claims**

1. A visible-UV horizon sensor for providing attitude information at geosynchronous altitudes from a satellite comprising:

a plurality of detector means selectively responsive to scattered sunlight in the visible and ultraviolet spectral bands,

means for directing the fields of view of said detector means over the earth's disc at a plurality of locations whereby said detector means generate electrical signals in response to the intensity of visible and ultraviolet radiation from the crescent or fully illuminated earth disc,

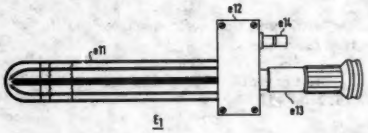
circuit means having said electrical signals from said detector means applied thereto for producing attitude information for said satellite providing the satellite's position with respect to the earth.



4,628,207
SPECIAL ENDOSCOPE FOR VISUALLY TESTING FOR CRACKS

Bernd Elfert, Mülheim, and Werner Schölly, Denzlingen, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,576
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412434; Oct. 24, 1984, 3438971
Int. Cl.[4] G02B *23/26*
U.S. Cl. 250—461.1 **17 Claims**



1. Special endoscope for examining the structure of surfaces of measuring sites in narrow gaps formed in parts to be inspected, comprising a probe having an end, a narrow canal with a substantially uniform cross section disposed in said probe, at least one magnifying image-conducting optical system disposed in said canal having a receiving end face, image-illuminating optical systems disposed in said probe in the form of a plurality of optical waveguide strands having transmitting end faces at said end of said probe in immediate vicinity of said receiving end face, said transmitting end faces being grouped about said receiving end face for illuminating the measuring site, a UV light source connected to said image-illuminating optical systems for transmitting rays from said transmitting end faces and reflecting the rays off the surface structure in the visible frequency range onto said receiving end face, means connected to said image-conducting optical system for producing a real image from the rays, said canal being in the form of one capillary disposed substantially along a center line of said probe and other capillaries in which said image-illuminating optical systems are disposed, an arched protective bracket defining an outer contour of said probe and surrounding said image-conducting optical system, said image-illuminating optical systems and said transmitting and receiving end faces, and a stiffening leaf interconnecting and mutually fixing said capillaries and said bracket in place.

4,628,208

RADIATION IMAGE STORAGE PANEL

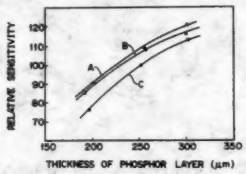
Satoshi Arakawa, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 17, 1983, Ser. No. 542,651

Claims priority, application Japan, Oct. 19, 1982, 57-182111

Int. Cl.[4] G01J *1/58*; G01N *21/64, 23/38*; G01T *1/00*

U.S. Cl. 250—483.1 14 Claims



1. A radiation image storage panel comprising a support and at least one phosphor layer provided thereon which comprises a binder and a stimulable phosphor dispersed therein, said panel, in use, being subjected to a radiation having passed through an object or having radiated from an object to cause said stimulable phosphor to absorb said radiation, followed by exciting said stimulable phosphor with an electromagnetic wave to release radiation stored in said stimulable phosphor as emitted light, and detecting said emitted light, wherein the support is a resin film containing anatase-type titanium dioxide.

4,628,209

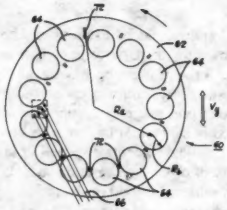
PARTICLE IMPLANTATION APPARATUS AND METHOD

Andrew Wittkower, Rockport, Mass., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 7, 1985, Ser. No. 742,492

Int. Cl.[4] A61K *27/02*; G21K *5/00*; H01J *37/00*

U.S. Cl. 250—492.2 14 Claims



1. A system for treating a workpiece by directing a beam of particles at the workpiece, comprising:

a support having means for mounting said workpiece for rotation through the beam to cause particles to impinge upon the workpiece, said support defining a plurality of apertures at different distances from a support axis of rotation to allow particles from said beam to pass through said support;

detector means for measuring the intensity of particles passing through the apertures in said support; and

drive means for moving said support relative to said beam to cause said beam to be directed at different regions of said support and to pass through different ones of said plurality of apertures.

4,628,210

BINOCULAR ARTIFICIAL VISION SYSTEM WITH VARIABLE EYEBASE IN RESPONSE TO A QUALITY OF CORRELATION SIGNAL

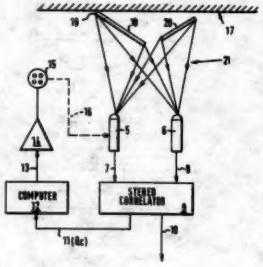
Gilbert L. Hobrough, Westbury, 5 Station Road, Bentley, Farnham, Hampshire, England

Filed Oct. 14, 1983, Ser. No. 542,188

Claims priority, application United Kingdom, Oct. 28, 1982, 8230799

Int. Cl.[4] G01C *11/12*

U.S. Cl. 250—558 5 Claims



1. A binocular artificial vision system including:

(i) left and right video cameras so arranged on an eyebase as to have overlapping fields-of-view of a workspace including a background and at least one object separated from said background, said video cameras respectively producing left and right video signals;

(ii) means mounting said cameras for relative physical movement to vary said eyebase;

(iii) stereo correlator means so connected to said left and right video cameras as to receive said left and right video signals and to provide as an output a correlated range distance signal and a quality of correlation signal; and

(iv) means so connected to said camera mounting means and to said stereo correlator means as to receive said quality of correlation signal and vary said camera eyebase in response to the value of said quality of correlation signal.

4,628,211

CIRCUIT ARRANGEMENT FOR CROSSTALK COMPENSATION IN ELECTRO-OPTICAL SCANNERS

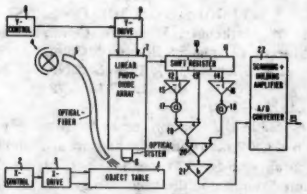
Werner Ruppert, Schonaich, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1984, Ser. No. 588,468

Claims priority, application European Pat. Off., Mar. 30, 1983, 83103166.1

Int. Cl.[4] H04N *3/14*

U.S. Cl. 250—578 5 Claims



1. In an electro-optical scanner having a linear array of photodetector cells, each of said cells having means for producing a signal R related to light intensity, said array including adjacent cells (i−1), (i) and (i+1) which produce signals of

value $R_{(i-1)}$, $R_{(i)}$ and $R_{(i+1)}$, a circuit arrangement for crosstalk compensation comprising:

(a) means for storing the value $R_{(i)}$ of the signal produced by cell (i) and the values $R_{(i-1)}$ and $R_{(i+1)}$ from adjacent cells (i−1) and (i+1) respectively; and

(b) means, connected to said storing means, for producing a compensated output I_i for cell (i) whereby $I_{(i)}$ is computed in accordance with the relationship

$$I(i) \approx \frac{R_{(i)} - aR_{(i+1)} - aR_{(i-1)}}{1 - 2a - 2a^2}$$

wherein a is a constant factor determined by the degree of crosstalk between adjacent cells.

4,628,212

OCEANO-THERMOSTERIC POWER PLANT

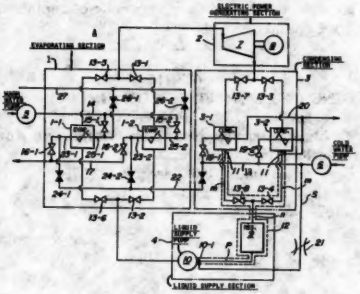
Haruo Uehara, and Tsutomu Nakaoka, both of Saga, Japan, assignors to Saga University, Saga, Japan

Filed Apr. 12, 1985, Ser. No. 722,368

Claims priority, application Japan, Apr. 17, 1984, 59-75788

Int. Cl.⁴ H02P *9/04*; F03G *7/04*

U.S. Cl. 290—54 **3 Claims**



1. An oceano-thermosteric power plant, comprising

generating means for generating electrical energy from the vapor of an actuating liquid, said generating means having an input and an output;

evaporating means including a plurality of evaporators each having a first part for the circulation therethrough of warm ocean water drawn from a superficial layer of the ocean and a second part for receiving said actuating liquid, the outputs of the second parts of said evaporators being connected to the input of said generating means,

condensing means including a plurality of condensers each having a first part for the circulation of cold ocean water therethrough, said cold water being obtained from a location in the ocean relatively far below the surface thereof, and a second part for receiving vapor from the output of said generating means, the inputs of the second parts of said condensers being connected to the output of said generating means;

actuating liquid supply means comprising a liquid reservoir and a liquid supply pump connected thereto, the input of said actuating liquid supply means being connected to the outputs of the second parts of said condensers, and the output of said actuating liquid supply means being connected to the inputs of the second parts of said evaporators, said actuating liquid being formed in said condensing means by condensing vapor exhausted from the output of said generating means;

means for supplying said warm water to the first parts of said evaporators, said warm water flowing through said evaporators in a given direction to transform the liquid from the output of said actuating liquid supply means to a vapor for introduction into said generating means; and

means for disconnecting the supply of warm water from the first part of at least one selected evaporator and for circulating said cold water through said selected evaporator in a direction opposite said given direction, whereby during periods of relatively light electrical load cold water is circulated through said selected evaporator to remove filth deposited therein.

4,628,213

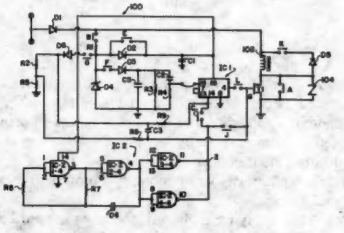
ELECTRONIC CIRCUITS FOR DRIVING BELLS OR ELECTROMAGNETIC DEVICES

William P. Buyak, New Hartford, Conn., assignor to General Signal Corporation, Stamford, Conn.

Filed Aug. 9, 1985, Ser. No. 764,154

Int. Cl.⁴ H02J *17/00*; G08B *3/00*

U.S. Cl. 307—80 **5 Claims**



1. An electronic circuit for driving a bell or the like comprising:

a first source of AC and DC power;

a first diode and a coil connected in series to said power source;

a second power source, including a first resistor and a second diode connectible in series with said first diode, and a filter capacitor in shunt with said second diode;

a solid state switch connectible to said coil;

an oscillator connectible between (a) the junction of said first resistor and said second diode, and (b) an input of said solid state switch;

a counter connectible to an input of said solid state switch;

a first network connectible to a first input of said counter;

a second network connectible from said junction to a second input of said counter and to said input of said solid state switch;

switching means having a plurality of movable contacts and associated fixed contacts;

said switching means being operative to establish a first, second, third, and fourth modes of operation for said current, whereby in a first position of said switching means the first diode and coil are connected alone in series with said AC power;

in a second position of said switching means, DC power is connected, said solid state switch is connected in series with said first diode and said coil, and said second power source is connected to an input of said oscillator, the output of said oscillator being connected to said input of said solid state switch;

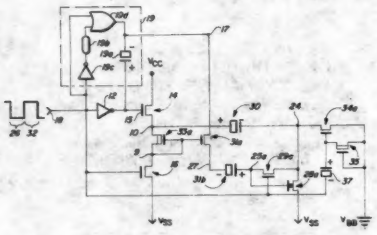
in a third position, AC power is connected, said counter has its output connected to said input of said solid state switch, said first network is connected from said junction of said first resistor and said second diode to an input of said counter, and said second network is connected from said junction to another input of said counter, as well as to said input of said solid state switch;

and in a fourth position of said switching means, DC power is again connected, said oscillator is connected to another input of said counter and said second network is disconnected therefrom.

4,628,214
BACK BIAS GENERATOR

Horst Leuschner, Phoenix, Ariz., assignor to SGS Semiconductor Corporation, Phoenix, Ariz.

Filed May 22, 1985, Ser. No. 736,851
Int. Cl.[4] H02M 3/18; H03K 17/687, 17/30
U.S. Cl. 307—296 R 18 Claims



1. An improved on-chip back-bias generator circuit for an NMOS integrated circuit using only N channel transistors, the integrated circuit being powered by voltages, V_{SS} and V_{CC} and having a substrate at a voltage V_{SS}, the improved circuit adapted for being driven by an output signal from an oscillator, the improvement comprising:

a charge pump capacitor having an input end and an output end thereof;

means for applying a charging voltage to said input end of said capacitor, said charging voltage having a value essentially equal to a highest voltage on the integrated circuit chip;

means for clamping said output end of said capacitor to a voltage essentially equal to a lowest voltage on the integrated circuit during a time when the capacitor is being charged;

means for essentially isolating said output end of said capacitor from the substrate during said time when said capacitor is being charged; and

means for coupling said output end of said capacitor to said substrate essentially without any voltage drop during a time when the capacitor is not being charged, said coupling means further comprising:

a switched transistor having a source terminal, a drain terminal and a gate terminal;

a constant current source, said constant current source being connected between said gate terminal of said switched transistor and the substrate for biasing the average gate-to-source potential difference of the switched transistor to zero volts so that during the time said capacitor is being charged it is negative and during the capacitor non-charging time it is more positive than the switched transistor threshold voltage said source terminal of said switched transistor being connected to said output end of said capacitor, said drain terminal of said switched transistor being connected to the substrate and said gate terminal of said switched transistor being connected via a further capacitor to the oscillator output signal terminal.

4,628,215
DRIVE CIRCUIT FOR SUBSTRATE PUMP

Perry W. Lou, Sugar Land, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 17, 1984, Ser. No. 651,140
Int. Cl.[4] H03L 1/00; G05F 3/24; H03K 17/693
U.S. Cl. 307—297 8 Claims

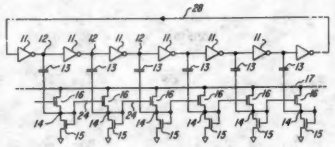
6. A substrate pump circuit for a semiconductor chip, comprising:

a plurality of inverters, each inverter having an input and an output, the output of each of said inverters connected to the input of another of said inverters;

a plurality of drive circuits, each drive circuit associated with one of said inverters, and each drive circuit comprising:

a pump node,

a capacitor connected between said pump node and the output of the inverter stage associated with said drive circuit,



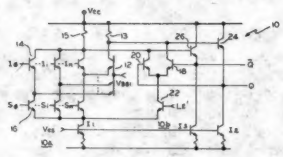
a first transistor having a source-to-drain path coupling said pump node to a ground terminal and having a gate connected to said pump node, and

a second transistor having a source-to-drain path coupling said pump node to the substrate of said chip, and having a gate connected to the pump node of another of said drive circuits.

4,628,216
MERGING OF LOGIC FUNCTION CIRCUITS TO ECL LATCH OR FLIP-FLOP CIRCUIT

Nikhil C. Mazumder, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 9, 1984, Ser. No. 628,706
Int. Cl.[4] H03K 19/086
U.S. Cl. 307—455 11 Claims



1. A combination circuit formed of a functional circuit portion coupled to a latch circuit portion which is fabricated as a single gate on an integrated circuit semiconductor chip, said combination circuit comprising:

a latch circuit portion including a pair of first and second latch transistors whose emitters are commonly connected;

the bases of said first and second latch transistors being coupled to receive input signals from a master circuit portion;

a latch enable transistor having its collector tied to the common emitters of said first and second latch transistors, its emitter connected to a first current source, and its base connected to a latch enable terminal;

a first output transistor having its base connected to the collector of said first latch transistor, its collector connected to a supply potential and its emitter coupled to a true output signal terminal;

a second output transistor having its base connected to the collector of said second latch transistor, its collector con-

nected to the supply potential and its emitter coupled to a complementary output signal terminal;

the emitter of said first output transistor being connected to the base of said second latch transistor and to a second current source and the emitter of said second output transistor being connected to the base of said first latch transistor and to a third current source;

a functional circuit portion having inputs and outputs, the inputs of said functional circuit portion being coupled to receive data signals;

a master circuit portion having inputs and outputs, the inputs of said master circuit portion being connected to the outputs of the functional circuit portion;

the master circuit portion having its outputs coupled to the bases of said first and second latch transistors of said latch circuit portion to provide the input signals; and

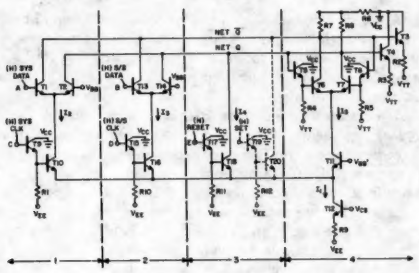
said master circuit portion and said latch portion forming a flip-flop circuit.

4,628,217

FAST SCAN/SET TESTABLE LATCH USING TWO LEVELS OF SERIES GATING WITH ONE CURRENT SOURCE

Dale F. Berndt, Plymouth, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 22, 1984, Ser. No. 592,149
Int. Cl.⁴ H03K *19/086*
U.S. Cl. 307—467 **5 Claims**



1. In interconnection to and functional augmentation of a two-level-series-gated one-current-source feedback latch circuit

employing one current source supplying current, serially connected to

a first-level current-switch responisve to a received system clock signal for steering said current either to maintain, as a feedback current, said latch circuit in a set or clear state or else steering said current to one second-level current-switch responsive to a received system data signal for steering current received of said first-level current switch to either a clear Q or else to a set Q signal outputs of said latch circuit in order to respectively set or clear said latch circuit,

a circuit apparatus interconnected to said feedback latch circuit for making said feedback latch fircuit functionally responsive to received scan/set data and scan/set clock signals thereby making said feedback latch circuit scan/set testable, said circuit apparatus comprising:

a first-level gating-circuit

constituting a substitutionary inverting one-half of said first-level current switch while a normal inverting one-half of said first-level current switch is inactive due to absence of said received system clock signal,

said first-level gating-circuit connected intermediary said current source and another second-level current switch,

said first gating-circuit being interactive with the normal non-inverting one-half of said first-level current-switch, which said normal non-inverting one-half of said first-level current-switch is also connected to said current source and upon said first-level, in order to sufficiently form by said being interactive a complete current-switch upon said first-level,

WHEREIN said complete current-switch is responsive to said scan/set clock signal for IF said scan/set clock signal is true THEN steering said current received of said current source to said another second-level current-switch ELSE IF said scan/set clock signal is false THEN steering no current to said another second-level current-switch and doing naught but presenting but a small, non-interfering, impedance to the operation of said normally constituted first-level current-switch; and

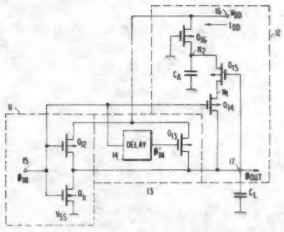
said another second-level current switch is connected between said first-level gating circuit and said signal outputs of said feedback latch, comprising collector-dotted connections to each said clear Q and set Q signal outputs of said feedback latch circuit, for IF supplied with a current steered from said complete current-switch THEN, responsively to the binary state of a received said scan/set data signal, IF said scan/set data input signal is true THEN steering said current to said clear Q signal output of said feedback latch circuit sufficient to set said feedback latch circuit ELSE IF said scan/set data input signal is false THEN steering said current to said set Q signal output of said feedback latch circuit sufficient to clear said feedback latch circuit, ELSE IF not supplied with a current steered from said complete current-switch THEN doing naught but presenting a small capacitance to said set Q and said clear Q signal outputs of said feedback latch circuit.

4,628,218

DRIVING CIRCUIT SUPPRESSING PEAK VALUE OF CHARGING CURRENT FROM POWER SUPPLY TO CAPACITIVE LOAD

Kazuo Nakaizumi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1983, Ser. No. 463,420
Claims priority, application Japan, Feb. 3, 1982, 57-16122
Int. Cl.⁴ H03K *17/12, 17/04, 19/017, 17/13*
U.S. Cl. 307—451 **11 Claims**



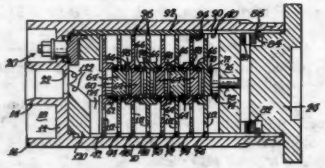
1. An inverter circuit comprising a first field effect transistor of one conductivity type, a second field effect transistor of the opposite conductivity type connected with said first transistor in series between two terminals of a power supply, an input terminal coupled to the gates of said first and second transistors, an output terminal coupled to the connection point of said first and second transistors, a capacitive load coupled to said output terminal, a capacitor, first means coupled to said capacitor and to one of said two terminals of the power supply for charging said capacitor at a time other than a transient time when a potential at said output terminal transfers from a first level to a second level, and a second means coupled to said capacitor and said capacitive load for charging said capacitive load with a discharging current from said capacitor during said transient time.

4,628,219

RECTIFIER ASSEMBLY FOR MOUNTING IN A ROTOR

Mark A. Troscinski, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 13, 1985, Ser. No. 775,664
Int. Cl.[4] H02K *11/00*; F02N *25/08*
U.S. Cl. 310—68 D 11 Claims



1. A rectifier assembly adapted to be mounted in a generator rotor for rotation therewith comprising:

a generally tubular housing;

a stack of relatively thin plates formed of thermally and electrically conductive material within said housing;

at least one face of some of said plates including an axially directed annular ridge centrally of the face and defining a recess;

at least another face of others some of said plates having a central, axially projecting stud aligned with a recess in the adjacent face of the adjacent plate;

a diode wafer within each said recess;

means for applying a compressive pressure to said stack to bring said plates, studs, and wafers into good thermal and electrical contact;

electrical conductors extending through said stack and in electrical contact with predetermined ones of said elements and electrically isolated from predetermined others of said elements; and

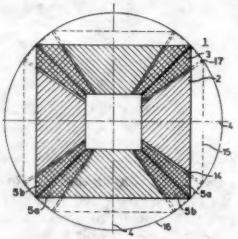
means for flowing a coolant through said housing including non-aligned apertures in said plates.

4,628,220

MOTOR ARRANGEMENT COMPRISING AT LEAST THREE CO-PLANAR CONICAL MOTORS

Anders G. Flogvall, Järfälla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 23, 1983, Ser. No. 507,205
Claims priority, application Sweden, Jun. 23, 1982, 8203884
Int. Cl.[4] H02K *16/00*
U.S. Cl. 310—114 9 Claims



1. A motor arrangement comprising at least three electric motors, axes of rotation of the motors being substantially coplanar and equi-angularly spaced about a common intersection of the axes,

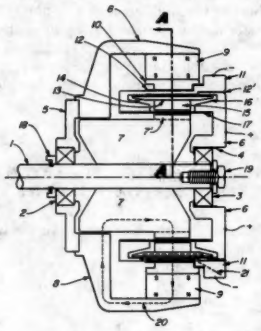
characterized in that each of said motors has a conical stator having a conical exterior surface, and a conical rotor, said stator and rotor each being a substantially rotational symmetrical body, each of said motors being shaped as a frustrum of a cone having the truncated face facing the intersection.

4,628,221

HOMOPOLAR MOTOR WITH PRESSURIZED LIQUID METAL CONTACT

Niels O. Young, 1735 Rush Rd., Eagle, Id. 83616

Filed Oct. 15, 1985, Ser. No. 787,322
Int. Cl.[4] H02K *31/04*
U.S. Cl. 310—178 4 Claims



1. A homopolar machine of the type wherein a liquid metal provides electrical connection between two fixed current collector rings and one rotatable current conducting ring, said homopolar machine comprising:

a rotor,

a stator assembly including magnetic means to provide a magnetic field and said two fixed current collector rings;

a frame of magnetic flux conducting material enclosing the rotor and the stator assembly;

said fixed current collector rings defining a void, said void disposed between the rotor and the magnetic means, said void concentric with the rotor, said void sealed for containing the liquid metal under pressure;

said rotatable current conducting ring disposed within said void, said liquid metal providing electrical contact between each edge of said rotatable current conducting ring and a different one of said two fixed current collector rings, and said liquid metal hydrodynamically supporting said rotatable current conducting ring in a spaced-apart gap defining relation with the stator assembly for permitting rotation of the rotatable current conducting ring relative to the stator assembly in response to an electrical current flowing in the rotatable current conducting ring; and

magnetic coupling means for magnetically coupling a torque from said rotatable current conducting ring to said rotor.

4,628,222

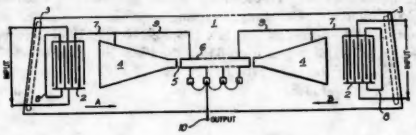
PROTECTION OF SAW DEVICES COMPRISING METALLIZED REGIONS ON DIELECTRIC SUBSTRATES

Meirion F. Lewis, Malvern, England, assignor to National Research Development Corporation, London, England

Division of Ser. No. 396,900, Jul. 8, 1982, Pat. No. 4,448,805.
This application Mar. 1, 1984, Ser. No. 585,166
Claims priority, application United Kingdom, Nov. 17, 1980, 8036806; PCT Int'l Appl., Oct. 12, 1981, PCT/GB81/00222
Int. Cl.[4] H03H *9/25*; B05D *5/12*
U.S. Cl. 310—313 R 20 Claims

1. In a surface acoustic wave device having at least two thin film structures disposed on the surface of a substrate, there being a gap between said structures, said structures being

arranged so that a surface acoustic wave traversing a first of said structures is communicated across said gap to the second of said structures, and a thin film loop electrically shunting said



gap to prevent cracks in the gap region of said substrate from being induced during fabrication of said surface acoustic wave device.

4,628,223

COMPOSITE CERAMIC/POLYMER PIEZOELECTRIC MATERIAL

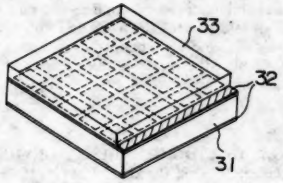
Hiroshi Takeuchi, Matsudo; Chitose Nakaya, Tokyo; Shinichiro Umemura, Hachioji, and Kageyoshi Katakura, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,098

Claims priority, application Japan, Oct. 19, 1983, 58-194233

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—358 **3 Claims**



1. An ultrasonic probe comprising a plate of a composite piezoelectric material having a region of piezoelectric ceramic polarized uniformly in a thicknesswise direction and a region of polymer, both said regions existing along the thicknesswise direction and being dispersed alternately in a direction parallel to a major plate surface, electrodes formed on each major plate surface of said plate of the composite piezoelectric material, and an acoustic connecting layer formed on at least one major plate surface of said plate of the composite piezoelectric material composed of a material harder than said polymer and having a modulus of elasticity in the range of 0.4×10^{10} to 1.3×10^{10} N/m^2.

4,628,224

BEAM SHAPING CRT ELECTRODE

Floyd K. Collins, Seneca Falls, and Donald L. Say, Waterloo, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Continuation of Ser. No. 175,165, Aug. 4, 1980, abandoned. This application Sep. 3, 1985, Ser. No. 771,957

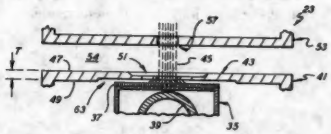
Int. Cl.⁴ H01J *29/46*

U.S. Cl. 313—414 **4 Claims**

1. An improved CRT electron gun assembly comprised of several related electron guns, each gun having a cathode and a plurality of sequentially arranged cooperating electrodes, including a G1 grid electrode positioned adjacent the cathode and a G2 grid electrode adjacent the G1 grid electrode, the G1 grid electrode having a one piece effectual portion transversely oriented to the path of the beam bundle of electrons, the effectual portion having:

an upper surface and a lower surface defining a material thickness T;

an elongated recess formed inward from the upper surface and forming a substantially sharp parametrical edge with the upper surface at least in the central region thereof, the recess having a width W and a depth D; a depression formed inward from the lower surface in opposed orientation to and symmetrical with the recess, the depression having a substantially circular shape when viewed transversely to the path of the beam bundle of electrons, and having a depth d; the bottom of the recess and the bottom of the depression defining a material thickness t less than thickness T, the depth D not exceeding the thickness t, and the depth d being less than the thickness t; an aperture formed in symmetrical relationship with the recess and the depression, the aperture having a width A slightly less than the width W of the recess; the G1 and G2 electrodes together beneficially modifying the shaping of the beam bundle of electrons passing therethrough.



4,628,225

ELECTRODE FOR LASER STIMULATION LAMPS

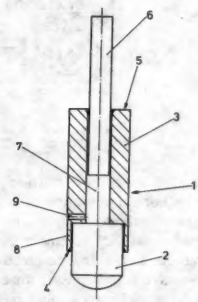
Dieter Keim, Mühlheim/Main, and Helmut Fischer, Hanau, both of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Oct. 20, 1983, Ser. No. 543,614

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240359

Int. Cl.⁴ H01J *61/06*

U.S. Cl. 313—631 **11 Claims**



1. In combination with a laser stimulation lamp

an easily length-adjustable electrode (1) comprising

a tubular cylindrical carrier body (3) having a longitudinal central bore (7) and a vent hole (9) from said central bore (7) to an outer surface of said carrier body (3) to provide for communication between said central bore and the interior of said envelope (13);

an electrode element (2) of a material having a low work function for the emission of charge carriers secured and partially located within a widened portion of said central bore (7) at a first end portion (4) of said carrier body (3), said electrode element projecting from said first end portion of the carrier body (3)

a mounting pin (6) of predetermined length having a first

terminal portion telescopically received within and located partially in said central bore (7), telescopically slidable into and out of said central bore (7) through a second end portion (5) of the carrier body (3);

and means (10*a*, 10*b*) for securing the mounting pin in fixed position within said central bore to determine the total length of the electrode, said positioning means permitting locating the carrier body (3) at a selected axial position with respect to the mounting pin and to locate the carrier body (3) and hence the electrode element (2) projecting from the carrier body at a selected position to thereby define the total length of the electrode.

4,628,226

METHOD AND ARRANGEMENT FOR PREVENTING CATHODE DAMAGE WHEN SWITCHING ON FIELD EMISSION ELECTRON GUNS

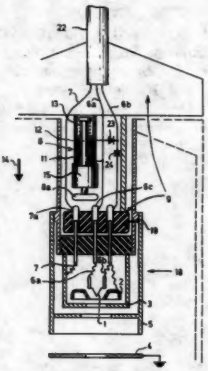
Dieter Kurz, Aalen, and Norbert Schäfer, Essingen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Sep. 5, 1984, Ser. No. 647,625

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332549

Int. Cl.[4] H05B *39/00*; H01J *19/32*

U.S. Cl. 315—102 **15 Claims**



8. An electron gun wherein a burn-in period for the cathode thereof precedes normal operation of the gun thereby preventing damage to the cathode, the electron gun comprising:

a field emission cathode assembly including: a cathode; a first electrode; and, a ground electrode;

extraction voltage supply means for applying an extraction voltage across said cathode and said first electrode;

accelerating voltage supply means for applying an accelerating voltage across said cathode and said ground electrode;

switching means for establishing a galvanic connection between said cathode and said first electrode before said extraction voltage and said acceleration voltage are applied;

actuating means for actuating said switching means to establish and interrupt said galvanic connection whereby said galvanic connection is maintained for a predetermined burn-in time period before normal operation of said electron gun is begun; and,

circuit means for applying only said accelerating voltage across said cathode and said ground electrode during said burn-in time period.

4,628,227

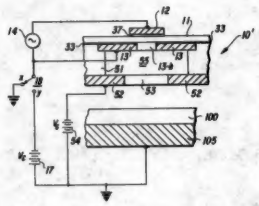
MICA-ELECTRODE LAMINATIONS FOR THE GENERATION OF IONS IN AIR

Richard L. Briere, Hopkinton, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 194,649, Oct. 6, 1980, Pat. No. 4,381,327. This application Mar. 28, 1983, Ser. No. 479,547

Int. Cl.[4] H01J *7/24*; H05B *31/26*

U.S. Cl. 315—111.81 **18 Claims**



1. An ion generator comprising:

a mica sheet;

at least one "driver" electrode bonded to a face of said mica sheet;

at least one "control" electrode bonded to an opposite face of said mica sheet; and

a time-varying potential applied between said electrodes to form ion-producing glow discharges in an air region in the vicinity of said control electrode and said mica sheet,

wherein said electrodes are bonded to said mica sheet with a thermoplastic adhesive of a thickness in the range 0.5 micron–5 microns.

4,628,228

GAS DISCHARGE DISPLAY DEVICE

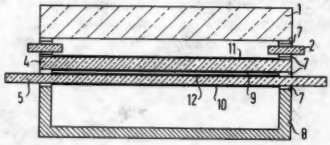
Walter Geffcken, Munich; Burkhard Littwin, Hohenschäftlarn, and Rolf Wengert, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 470,702, Feb. 28, 1983, abandoned. This application Mar. 27, 1985, Ser. No. 716,526

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207685

Int. Cl.[4] G09G *3/10*; H01J *17/49*

U.S. Cl. 315—169.4 **11 Claims**



1. Gas discharge display device having a gas-filled space gas-tightly closed on one side by a front plate and on a side opposite thereto by a back plate and subdivided by a control plate into a gas discharge space and a post-acceleration space, the control plate having electrode paths disposed thereon respectively addressable separately and forming a matrix as row conductors on one side of the control plate and as column conductors on the other side of the control plate, and having, together with the electrode paths, control through-holes at intersection points of the matrix, a fluorescent screen disposed on the side of the front plate oppoite the control plate and defining the post-acceleration space, the fluorescent screen having an anode layer thereon, and at least one insulated cath-

ode on a side of the back plate and defining the gas discharge space, the control plate having, on the side thereof facing towards the post-acceleration space, a plate having a raster of holes formed therein coincident with a raster of the control holes formed in the control plate, comprising a supplementary control plate having a selective number of at most two additional potential planes separated from one another, and strip lines disposed on at least one side of said supplementary control plate for conducting an electric current, said strip lines being aligned parallel to the row conductors of the control plate and having selectively applicable thereto an electric passing and blocking potential for electrons flying towards the fluorescent screen.

4,628,229

FLASHLIGHT EMISSION APPARATUS

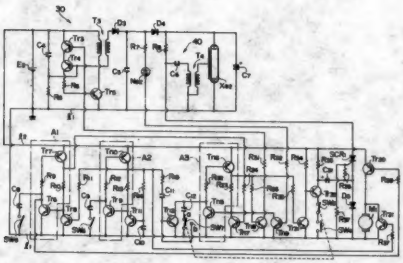
Akira Inoue, Hachioji, Japan, assignor to Olympus Optical Company, Ltd, Tokyo, Japan

Filed Dec. 16, 1983, Ser. No. 562,179

Claims priority, application Japan, Feb. 15, 1983, 58-23625; Feb. 22, 1983, 58-28174

Int. Cl.[4] H05B *37/00, 39/00, 41/14*

U.S. Cl. 315—241 P **15 Claims**



1. A flashlight emission apparatus comprising:

a converter for effecting a booster action for an output from a low voltage source;

a main discharge capacitor connected to be charged by an output from the converter;

detector means for generating an output when the main capacitor has been charged to a given voltage;

latch means which are turned on when the main discharge capacitor is charging to enable said converter and being turned off responsive to said detector means to disable said converter and prevent further charging of the main discharge capacitor when it has been charged to said given voltage;

a flash discharge tube connected to cause a discharge of the main capacitor therethrough to emit flashlight;

semiconductor means coupled between said converter and detector means and said main capacitor to permit discharge of the main capacitor only through said flash tube;

means for initiating the emission of flashlight from the flash discharge tube comprising a trigger circuit associated with the flash discharge tube for developing a trigger condition and having a trigger capacitor charged by said converter; and

means responsive to an output from the detecting means for disabling the emission initiating means until the voltage across the nain capacitor reaches the given value, said disabling means comprising a switching element within the emission initiating means responsive to the on state of said latch means for normally preventing the operation of the emission initiating means and responsive to the turn off of the latch means by the detecting means output for enabling the emission initiating means.

4,628,230

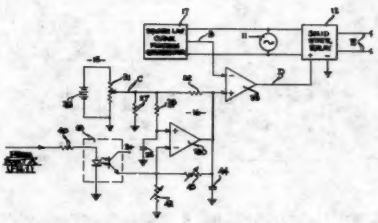
REGULATED LIGHT DIMMER CONTROL

William G. Krokaugger, Chatsworth, Calif., assignor to Mole-Richardson Company, Hollywood, Calif.

Filed Aug. 5, 1985, Ser. No. 762,716

Int. Cl.[4] H02B *37/02*

U.S. Cl. 315—307 **4 Claims**



1. A light dimmer circuit for controlling the level of illumination of lamps comprising:

an A.C. power source;

dimmer control means for providing a preselected D.C. output;

timing circuit means for providing a periodic D.C. waveform, the A.C. power source being connected to said timing circuit means to synchronize said periodic waveform with said power source;

rectifier and filter means for rectifying A.C. from said power source to D.C. and filtering the rectified D.C.;

means for providing a negative D.C. feedback signal from the output of said rectifier and filter means to limit the output of said rectifier and filter means;

a differential amplifier for receiving said negative D.C. feedback signal and a signal in accordance with the preselected D.C. output of said dimmer control means and providing a D.C. output signal in accordance with the difference therebetween;

solid state relay means interposed between the A.C. power source and said rectifier and filter means for connecting said A.C. power source to said rectifier and filter means; and

voltage controller means for firing said solid state relay means in accordance with the voltage output of said dimmer control means, said voltage controller means comprising a voltage comparator connected to receive the D.C. output of said dimmer control means, the D.C. output of said differential amplifier, and the D.C. periodic waveform output of said timing circuit means and operating to fire said solid state relay and maintain said relay activated only during periods when said D.C. outputs provide a signal having an amplitude equal to or greater than that of said waveform output;

the rectifier and filter means being connected to said lamps to provide D.C. thereto in accordance with the duration of the period during which the solid state relay is fired which is a function of the D.C. output of said dimmer control means.

4,628,231

DC MOTOR WITH ELECTRONIC COMMUTATION CIRCUIT

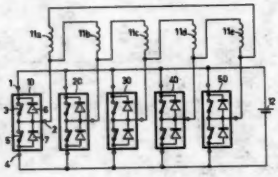
Wolfgang Radziwill, Aachen; Günter Döring, Würselen, both of Fed. Rep. of Germany, and Hans Steinbusch, Schaesberg, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1980, Ser. No. 191,104

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1979, 2940637

Int. Cl.⁴ H02K *29/00*

U.S. Cl. 318—138 **11 Claims**



1. A DC motor comprising a permanent-magnet rotor and an electronic commutation circuit including a plurality of magnetically controllable switches in the form of an integrated semiconductor circuit and controlled by the magnetic field of the rotor, a stator comprising m phase windings, each magnetically controllable switch including first and second input terminals, an output terminal and first and second switching paths between the first and second input terminals, respectively, and the output terminal, means connecting one end of each phase winding to the output terminal of a magnetically controllable switch, and a power supply source connected between the first and the second input terminals of each switch, said first and second switching paths being controllable so that, when a switch is exposed to a magnetic field B, its first switching path is closed if $B>B_0+[(\Delta B)/2]$, its second switching path is closed if $B<[(\Delta B)/2]$, and its two switching paths are open if $|B-B_0|<[(\Delta B)/2]\times\epsilon$, where $0<\epsilon<1$ and $\Delta B\geqq 0$, the individual switches being symmetrically arranged about the stator of the motor so that they are controlled by the rotor magnetic field in a cyclic sequence.

4,628,232

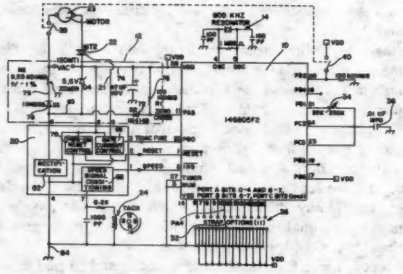
ANTI-PLUG REVERSING MODULE

Abraham Saganovsky, Brooklyn, and William W. Chester, Bronx, both of N.Y., assignors to KB Electronics Inc., Brooklyn, N.Y.

Filed May 28, 1985, Ser. No. 737,698

Int. Cl.⁴ H02P *1/22, 3/10*

U.S. Cl. 318—284 **6 Claims**



1. A circuit for reversing the direction of rotation of a D.C. motor comprising;

relay means, having a deenergized state and an energized state, for reversing the direction of current flow through the D.C. motor armature,

a three position, three wire, switch having a forward position, a reverse position and a motor braking position, each switch position corresponding to a motor operation,

means responsive to said switch being moved from said forward position to said reverse position while said D.C. motor is rotating in a forward direction, for removing motor driving voltage from said D.C. motor and for sensing motor counter-EMF to determine when said D.C. motor has essentially ceased rotation, and

means responsive to said means for sensing motor counter-EMF for operating said relay means to reverse the direction of current flow through the D.C. motor armature at a point at which motor rotation has essentially ceased.

4,628,233

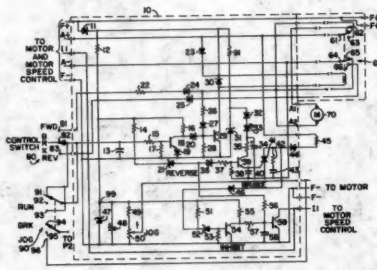
MICROPROCESSOR BASED MOTOR CONTROL

Robert Bradus, Randallstown, Md., assignor to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 592,809, Mar. 23, 1984. This application Oct. 4, 1985, Ser. No. 784,702

Int. Cl.⁴ H02P *7/28*

U.S. Cl. 318—306 **39 Claims**



1. A method of controlling a motor operable over a range of conduction angles comprising the steps of,

defining a first operating zone corresponding to conduction angles below a predetermined first angle;

defining a second operating zone corresponding to conduction angles between said first angle and a predetermined second angle greater than said first angle;

defining a third operating zone corresponding to conduction angles greater than said second angle;

selecting one of said operating zones and operating said motor according to the following

(a) for said first zone, operating said motor in an open loop configuration,

(b) for said second zone, varying the conduction angle in relation to the load, but not exceeding said second angle, to maintain a predetermined speed for conduction angles below said second angle,

(c) for said third zone, operating said motor in a closed loop configuration.

4,628,234

SAFETY DEVICE FOR AUTOMATIC WINDOW REGULATOR

Ken Mizuta, Miyagi, and Shiro Kondo, Furukawa, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Aug. 14, 1985, Ser. No. 765,607

Claims priority, application Japan, Aug. 14, 1984, 59-168872

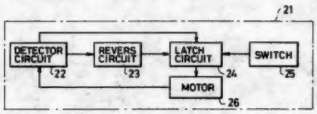
Int. Cl.⁴ H02P *1/22*

U.S. Cl. 318—267 **4 Claims**

1. In a safety device for an automatic window regulator of

the type having means for driving a motor for opening or closing a window in a frame, detector means for detecting a locked condition of the motor when a foreign object is caught between the window and the frame, and stopping means for stopping the motor from closing the window in response to a detection signal from the detector means,

the improvement wherein said detector means includes a sensor for detecting a voltage across said motor during

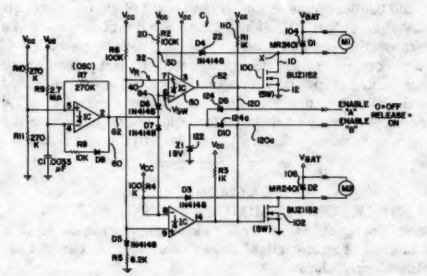


driving of said motor, a time delay and adder circuit for generating a lagging signal representing the voltage across said motor shifted by a predetermined time delay and having a predetermined voltage increment added thereto, and a comparator for comparing a voltage corresponding to the current actually driving said motor with said lagging signal and for providing a detection signal when said voltage corresponding to said current exceeds said lagging signal.

4,628,235
CONTROL CIRCUIT FOR MOTOR DRIVER

James R. Goings, Troy, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Sep. 19, 1985, Ser. No. 777,747
Int. Cl.[4] H02P 1/04
U.S. Cl. 318—430 **30 Claims**



1. A control circuit for operating a power switch with an associated resistance, said power switch having nonconductive and conductive conditions and adapted to apply a driving voltage across an electrical load circuit when said power switch is in its conductive condition, said control circuit comprising: means for creating a variable monitored signal corresponding to the generally instantaneous voltage across said power switch and associated resistance; means for creating a fixed reference signal; means for creating a control signal having a preselected electrical characteristic when said monitored signal has a given relationship with said reference signal; first means for shifting said power switch from the conductive condition to the nonconductive condition upon creation of said control signal; and, second means for periodically creating an energizing signal in the form of pulses shifting said power switch into said conductive condition when it is in said nonconductive condition.

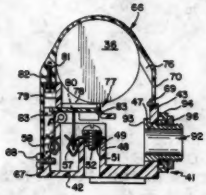
29. A method of operating a power switch with an associated resistance, said power switch having nonconductive and conductive conditions and adapted to apply a driving voltage across an electrical load circuit when said power switch is in its conductive condition, said method comprising the steps of:

(a) rendering said power switch conductive;
(b) measuring the voltage across said power switch and associated resistance;
(c) shifting said power switch to the nonconductive condition when said measured voltage exceeds a preselected value; and,
(d) creating a series of energizing pulses having a low duty cycle and a high frequency which pulses will render said power switch conductive when it is nonconductive.

4,628,236
ELECTRIC MOTOR CONTROL

Edward J. Schaefer, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Continuation-in-part of Ser. No. 632,955, Jul. 20, 1984, abandoned. This application Jan. 23, 1986, Ser. No. 821,777
Int. Cl.[4] H04R 11/02
U.S. Cl. 318—558 **16 Claims**

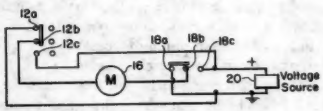


1. An electric motor control for attachment to a support wall or to a pressure switch, comprising a support having a base portion and a mounting portion, said base portion having a plurality of first electrical terminals attached thereto and having at least one lead opening formed therein for electrical leads, said mounting portion having a first hole formed therein, a motor control switch including a plurality of second electrical terminals connected to said terminals of said base portion, said mounting portion including first means for attaching said support to a pressure switch and second means for attaching said mounting portion to a support wall.

4,628,237
MOTORIZED UNIT FOR HOME ENTERTAINMENT DEVICES

Hien Vodinh, and Robert E. Pooler, both of Knoxville, Tenn., assignors to NAP Consumer Electronics Corp., New York, N.Y.

Filed Jul. 31, 1985, Ser. No. 761,132
Int. Cl.[4] G05G 5/00
U.S. Cl. 318—626 **4 Claims**



1. Apparatus for moving an appliance containing unit of a cabinet from a first to a second predetermined position or from said second to said first predetermined position relative to said cabinet in response to user activation, comprising

motor means for moving said unit from said first toward said second or from said second toward said first predetermined position upon energization in a first or second direction, respectively;

user operable control switch means having a first and second control position for energizing said motor means in said second or first direction, respectively;

limit switch means connected to said motor means and said

control switch means, said limit switch means having a first operating position adapted to maintain energization of said motor means in said first direction and prevent energization of said motor means in said second direction, and a second operating position maintaining energization of said motor means in said second direction and interrupting energization of said motor means in said first direction, said limit switch means comprising a single pole double throw switch mounted on said cabinet in a predetermined position relative to said appliance containing unit; and

limit switch operating means for moving said limit switch to said second or first operating position, respectively, when said unit is within a predetermined distance of said first or second predetermined position, respectively, said limit switch operating means comprising switch activating means mounted on said unit for movement therewith.

4,628,238

POSITIONING DEVICE COMPRISING PRE-STRESSED CONTACTLESS BEARINGS

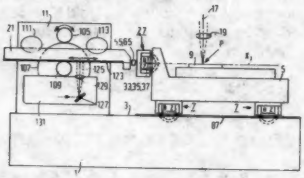
Hendricus F. G. Smulders; Johannes L. M. Hagen, and Marinus J. J. Dona, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 5, 1985, Ser. No. 741,057

Claims priority, application Netherlands, Mar. 29, 1985, 8500930

Int. Cl.[4] G05B *1/06*

U.S. Cl. 318—653 **15 Claims**



1. A positioning device comprising a flat table, a horizontal plate-shaped carrier displaceable in two orthogonal coordinate directions with respect to said flat table, said device including a first translation drive coupled to the carrier for exerting pushing and pulling forces on the carrier in a first coordinate direction, a second translation drive coupled to the carrier for exerting pushing and pulling forces on the carrier in a second coordinate direction at right angles to the first coordinate direction, said forces exerted on the carrier by said first and second drives lying in one horizontal plane, a first horizontally operating static push and pull bearing coupling said first drive to the carrier in a contactless manner via a viscous medium, and a second horizontally operating static push and pull bearing coupling said second drive to the carrier in a contactless manner via a viscous medium, each said first and said second push and pull bearings being pre-stressed in its respective first and second coordinate directions with an associated force acting to attract said carrier to said first and second drives to oppose the respective maximum occurring pulling force between said first and said second drives on the one hand and said carrier on the other hand whereby said drives and said carrier remain in operative relationship with each other notwithstanding the application of said maximum occurring pulling force.

4,628,239

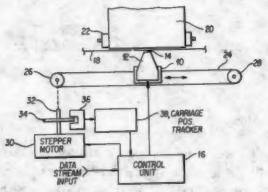
DUAL OPTICAL MECHANICAL POSITION TRACKER

Seth L. Everett, Jr., Lincroft, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 6, 1985, Ser. No. 742,152

Int. Cl.[4] G05B *19/40*

U.S. Cl. 318—685 **11 Claims**



1. Apparatus for determining the position and direction of print head carriage movement of an impact type printer, comprising:

drive motor means having a rotatable shaft coupled to a moveable carriage containing a print head;

a timing wheel mounted on said shaft, said timing wheel further including a single set of circumferentially equally spaced apertures having a mutual arcuate separation substantially equal to the arcuate distance across said apertures, said arcuate distance further being capable of framing pairs of photo emitter/sensor elements arranged side by side;

a pair of photo emitter elements arranged side by side adjacent said apertures on one side of said timing wheel;

a pair of photo sensor elements arranged side by side adjacent said apertures on the other side of said timing wheel and being in registration with said pair of emitter elements so that each emitter element directs a light beam toward a respective sensor element; and

means coupled to and being responsive to said pair of photo sensor elements for tracking a change of position from a last intentionally driven rest position in the presence of external forces applied such as shock and vibration and activating the drive motor means to return to said last driven rest position.

4,628,240

SYNCHRONOUS MOTOR CONTROL SYSTEM

Mitsuo Kurakake, Hino; Keiji Sakamoto, Hachioji, and Jiro Kinoshita, Yamato, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP84/00082, § 371 Date Nov. 5, 1984, § 102(e) Date Nov. 5, 1984, PCT Pub. No. WO84/03596, PCT Pub. Date Sep. 13, 1984

PCT Filed Mar. 2, 1984, Ser. No. 673,742

Claims priority, application Japan, Mar. 3, 1983, 58-34866

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—723 **4 Claims**

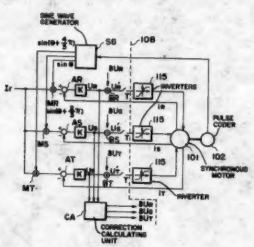
1. A synchronous motor control system for controlling a synchronous motor, comprising:

a detector, coupled to the synchronous motor, for detecting a rotational angle of the synchronous motor;

a control circuit, coupled to said detector, for generating a sine value corresponding to the rotational angle detected by said detector and for multiplying an effective current command by the sine value to produce an inverter drive signal in each phase; and

an inverter, having a physical saturable quantity and coupled to said control circuit and the synchronous motor, for providing current commands to armature windings of the synchronous motor in dependence upon the inverter drive signals from said control circuit, said control circuit determining, for each phase, when the corresponding inverter drive signal is in excess of the physical saturable quantity

of said inverter in that phase, and correcting that phase of the inverter drive signal which is provided to said inverter by a correction quantity, said control circuit correcting the inverter drive signals in the other phases based on the



correction quantity, said control circuit executing the corrections so that the waveforms of the current commands provided to the armature windings of the synchronous motor are always sine waves.

4,628,241

START-UP CONTROL METHOD AND APPARATUS FOR POLYPHAE INDUCTION MOTOR

Raymond E. Bristow, South Brent; Michael Fitzpatrick, Yealmpton, and David C. Groom, Harbertonford, all of England, assignors to Fairford Electronics Limited, Devon, England

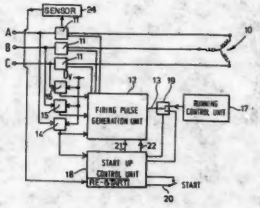
PCT No. PCT/GB84/00118, § 371 Date Dec. 3, 1984, § 102(e) Date Dec. 3, 1984, PCT Pub. No. WO84/04005, PCT Pub. Date Oct. 11, 1984

PCT Filed Apr. 4, 1984, Ser. No. 678,566

Claims priority, application United Kingdom, Apr. 5, 1983, 8309226

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—778 **9 Claims**



1. A method of controlling the start-up of a three phase a.c. induction motor (10) by the controlled firing of respective switching means (11) connected in series with each of the supply phases (A,B,C,) or motor windings, the switching means (11) each being of the type which conduct from the moment of application of a firing pulse until current therethrough ceases, said method comprising the steps of:

effecting an initial selective firing of the switching means (11) to cause current to flow between two only of the supply phases (B,C), this firing being timed relative to a predetermined point on one of the phase voltage waveforms (V_A) such that the voltage between said two phases (B,C) is decreasing in value at the moment of firing,

effecting firing of the third-phase immediately before the current in the said two phases first falls to zero, and

thereafter effecting sequential firing of the switching means (11) such as to progressively increase the angle of conduction of each switching means (11) from an initial minimum value.

4,628,242

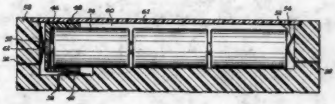
SYSTEM FOR CHARGING A RECHARGEABLE BATTERY

Clifford L. Scholefield, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Dec. 30, 1985, Ser. No. 814,442

Int. Cl.[4] H02J *7/00;* **H01M** *10/46*

U.S. Cl. 320—2 **4 Claims**



1. For use in an energy-using device adapted to operate from an external source of A-C power and from either rechargeable type or non-rechargeable type batteries of the same standard size and configuration, a charging system comprising in combination:

a housing for said energy-using device, said energy-using device operable in a first mode when connected to said external source of A-C power to supply said A-C power to a load disposed within said energy-using device and to recharge said rechargeable battery type and in a second mode when disconnected from said source of A-C power to supply power to said load alternatively from said rechargeable or non-rechargeable battery types;

an electrical charging circuit disposed within said housing of said energy-using device for charging said rechargeable battery type when said energy-using device is connected to said external source of A-C power;

a cavity disposed within said housing of said energy-using device for alternatively receiving therein batteries of both of said rechargeable and non-rechargeable types, each of said types having a positive power terminal and a negative power terminal for providing electrical energy from said battery types to said energy-using device;

a pair of discharge terminals for receiving power discharged from either of said battery types, said pair of discharge terminals residing in said cavity and permanently affixed within said housing, one of said pair adapted for current conducting engagement with one of said power terminals of said non-rechargeable battery type and the other of said pair adapted for current conducting engagement with the other of said power terminals of said non-rechargeable battery type;

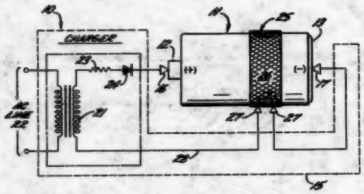
a charging contact connected in said charging circuit and residing in said cavity, said charging contact spaced-apart from each of said discharge terminals;

a removable charging adapter residing in said cavity when said rechargeable battery type is inserted into said cavity, said charging adapter carrying current conducting means for engaging said charging contact and for providing a current conducting path between said charging contact and one of said power terminals of said rechargeable battery type, the other of said power terminals of said rechargeable battery type engaging one of said discharge terminals whereby said one of said discharge terminals is operable as a second charging contact during charging of said rechargeable battery type, said removable adapter being removable from said cavity when said non-rechargeable battery type is residing within said cavity to preclude charging of said non-rechargeable battery type

4,628,243
BATTERY CHARGING SYSTEM HAVING MEANS FOR DISTINGUISHING BETWEEN PRIMARY AND SECONDARY BATTERIES

John S. Hodgman, and Ferdinand H. Mullersman, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Oct. 11, 1984, Ser. No. 659,918
Int. Cl.[4] H02J 7/00; H01M 10/44
U.S. Cl. 320—2 25 Claims



1. A battery charging system adapted to distinguish a rechargeable battery type from a nonrechargeable battery type, both said types being of substantially similar size, said system comprising, in combination:

a rechargeable battery having first and second external load terminals for delivery electrical energy;

indicia means on the rechargeable battery for providing an indication distinguishing said rechargeable battery from a non-rechargeable battery;

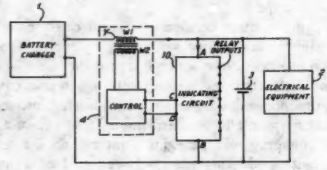
a charging device including a battery charging circuit having a first non-charging mode and a second charging mode, said circuit having first and second charging contacts arranged for engagement with the first and second external load terminals respectively when said rechargeable battery is connected to the charger, said first and second charging contacts each engageable by one of a pair of load terminals of a non-rechargeable battery; and

enabling means in said charging device for sensing the presence of the indicia means on the rechargeable battery and in response thereto enabling said charging mode, whereby the charger will be enabled to deliver charge current only by batteries of the rechargeable type.

4,628,244
ELECTRICAL INDICATING CIRCUIT

David L. Neasham, Penkridge, England, assignor to Thorn Emi Automation Limited, Rugeley, England

Filed Mar. 26, 1985, Ser. No. 716,250
Int. Cl.[4] H02J 7/04
U.S. Cl. 320—48 4 Claims



1. An electrical indicating circuit suitable for indicating an open circuit condition in a battery charging circuit in which a battery charger is coupled across a battery, the indicating circuit comprising

first circuit means for generating respective voltages related to the output current and the output voltage from the battery charger,

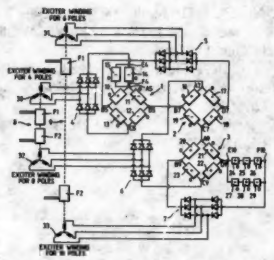
second circuit means for generating a ratio signal related to the ratio of the voltages, generated by said first circuit means, and so to the output impedance of the battery charger,

and third circuit means for comparing said ratio signal with a threshold signal and for generating an indication, indicative of an open circuit condition, in dependence on the comparison.

4,628,245
MULTIPOLAR EXCITATION SYSTEMS

George P. Quayle, Preston, England, assignor to Associated Electrical Industries Limited, England

PCT No. PCT/GB84/00195, § 371 Date Feb. 13, 1985, § 102(e) Date Feb. 13, 1985, PCT Pub. No. WO85/00078, PCT Pub. Date Jan. 3, 1985
PCT Filed Jun. 6, 1984, Ser. No. 705,334
Claims priority, application United Kingdom, Jun. 15, 1983, 8316283
Int. Cl.[4] H02P 9/00
U.S. Cl. 322—32 7 Claims



1. A variable pole number D.C. excited rotor winding arrangement for a dynamoelectric machine, comprising:

(i) a closed loop of at least three series-connected rotor winding sections;

(ii) at least first, second and third current supply terminals at respective interconnections of said winding sections;

(iii) a first pair of said winding sections wound for generating magnetic poles of opposite senses when fed in parallel, said first pair of winding sections being common to said first current supply terminal;

(iv) a second pair of said winding sections wound for generating magnetic poles of opposite senses when fed in series, said second pair of winding sections being common to said second current supply terminal;

(v) current supply means comprising:

(a) independently energizable first and second exciter windings for energizing said winding sections via said first and said second current supply terminals respectively,

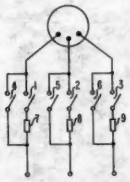
(b) respective first and second rotating rectifiers connected to said exciter windings; said current supply means reversing the current through at least one of said winding sections, according to the exciter winding which is energized, and thereby varying the pole number.

4,628,246

METHOD FOR PHASIC SEQUENTIAL COUPLING OF THREE-PHASE SHORT-CIRCUIT GENERATORS

Olav Dronen, 3520 Farum, Denmark

PCT No. PCT/DK82/00037, § 371 Date Dec. 27, 1983, § 102(e) Date Dec. 27, 1983, PCT Pub. No. WO82/03952, PCT Pub. Date Nov. 11, 1982
PCT Filed Apr. 29, 1982, Ser. No. 456,055
Claims priority, application Denmark, Apr. 29, 1981, 1893/81
Int. Cl.[4] H02J 3/08
U.S. Cl. 322—100 4 Claims



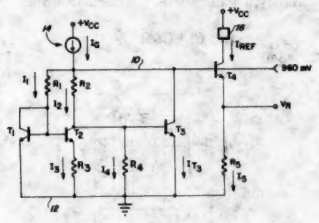
1. A method for phasic sequential coupling of a three-phase short-circuit generator to a power line, whereby coupling means in all three or at least two phase are actuated in a successive manner, characterized in detecting the instantenous voltage across the unactuated coupling means of at least the first power-supplying phase and actuating the respective coupling means in response to said detection at such a moment of time where said voltage shows a relative maximum amplitude.

4,628,247

VOLTAGE REGULATOR

Nazzareno Rossetti, Scottsdale, Ariz., assignor to SGS Semiconductor Corporation, Phoenix, Ariz.

Filed Aug. 5, 1985, Ser. No. 762,273
Int. Cl.[4] G05F 3/20
U.S. Cl. 323—314 6 Claims



1. In a prior art integrated circuit voltage regulator having an unregulated voltage input terminal and a regulated voltage output terminal, and further comprising:

a first transistor having an emitter, a collector and a base, the first transistor having a first base-emitter voltage characteristic, the collector of the first transistor being connected through a first resistor to a current source, said current source being derived from the unregulated voltage, the emitter of the first transistor being connected through a second resistor to a reference voltage; and

a second transistor having an emitter, a collector and a base, the second transistor having a second base-emitter voltage characteristic, the base of the second transistor being connected to the collector of the first transistor, the collector of the second transistor being connected to the current source, the emitter of the second transistor being connected to the reference voltage, the regulated output of the voltage regulator being provided at the collector of the second transistor and the regulated voltage output being a function of the first base-emitter voltage characteristic of the first transistor plus the quantity comprising the difference between the first base-emitter voltage characteristic of the first transistor and the second base-emitter voltage characteristic of the second transistor, times the ratio of the value of resistance of the first resistor and the value of resistance of the second resistor;

the improvement comprising:

a third transistor having a collector, an emitter and a base, said third transistor having a third base-emitter voltage characteristic, said third base-emitter voltage characteristic being substantially equal to said second base-emitter voltage characteristic, said collector of said third transistor being connected to the unregulated voltage source through a load, said emitter of said third transistor being connected to the voltage reference through a third resistor and said base of said third transistor being connected to the current source; and

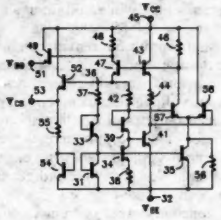
a fourth resistor being connected between the collector of the first transistor and the reference voltage, a regulated and temperature compensated voltage source being provided from said emitter of said third transistor, said regulated and temperature compensated voltage being regulated with respect to the reference voltage, and said emitter of said third transistor being connected to the regulated voltage output terminal.

4,628,248

NPN BANDGAP VOLTAGE GENERATOR

Mark S. Birrittella; Robert R. Marley, both of Phoenix, and Keith D. Nootbaar, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 31, 1985, Ser. No. 761,207
Int. Cl.[4] G05F 3/20
U.S. Cl. 323—314 15 Claims



1. A voltage reference circuit including a first output terminal for providing an output, a first supply voltage terminal, and a second supply voltage terminal, comprising:

first means for developing a first voltage having a positive temperature coefficient, comprising:

a first NPN transistor having an emitter coupled to said first output terminal, a collector coupled to said first supply voltage terminal, and a base;

second means coupled between said first output terminal and said second supply voltage means for providing a resistance;

a first resistor;

a second resistor;

a first diode;

a second diode;

third means for providing a resistance; and

a second NPN transistor having an emitter coupled to said second supply voltage terminal by said first resistor, a base coupled both to said second supply voltage terminal by said first diode and to said base of said first NPN transistor by said third means, and a collector coupled to a node by said second diode, said node coupled to said base of said first NPN transistor by said second resistor;

fourth means coupled to said first means for developing a

second voltage having a negative temperature coefficient, wherein said first and second voltages are combined to establish a temperature compensated voltage as an output;

fifth means coupled to said first and fourth means for sourcing current to both said first and fourth means; and

sixth means coupled to said first and fourth means and responsive to said first and second voltages and coupled to said fifth means for biasing said fifth means.

4,628,249

POWER SUPPLY HAVING A PREDETERMINED VALUE OF INPUT IMPEDANCE

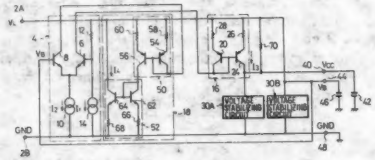
Yoshihiro Ikefuji, and Mitsuru Koiwa, both of Kyoto, Japan, assignors to Rohm Company Limited, Kyoto, Japan

Filed Jul. 13, 1984, Ser. No. 630,491

Claims priority, application Japan, Jul. 18, 1983, 58-131176

Int. Cl.⁴ G05F *3/20*

U.S. Cl. 323—315 **1 Claim**



1. A circuit for power supply, comprising:

a comparator circuit means for comparing an input signal voltage, in which alternating current signals are superposed on a direct current voltage, with a reference voltage and producing a non-inverted signal when said input signal has a fluctuation less than said reference voltage and an inverted signal when said input signal has a fluctuation more than said reference voltage;

a first constant-output-cuurent circuit means for generating a constant-output-current in response to a non-inverted output current from said comparator circuit means;

a first output-voltage-stabilizing circuit means for generating a stabilized output voltage in response to an output from said first constant-output-current circuit means;

a second output-voltage-stabilizing circuit means for receiving said input signal voltage and generating said reference voltage; and

a second constant-output-current circuit means including a first current mirror circuit means driven in response to an inverted output current from said comparator circuit means and a second current mirror circuit means drive:. by an output from said first current mirror circuit means and having NPN type transistors for flowing a superfluous current to a low potential line, said NPN type transistors each being connected at the collector thereof to a high potential line and at the emitter thereof to said low potential line.

4,628,250

POWER CONSERVING CMOS REFERENCE VOLTAGE SOURCE

Robert D. Lee, Denton, Tex., assignor to Thomson Components-Mostok Corporation, Carrollton, Tex.

Filed Nov. 20, 1984, Ser. No. 674,104

Int. Cl.⁴ G05F *3/16*

U.S. Cl. 323—317 **4 Claims**

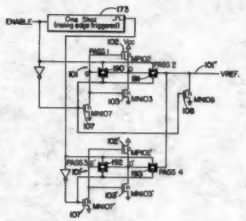
1. A power-conserving CMOS reference voltage generation circuit comprising

first (**101**) and second (**101'**) parallel reference voltage sources, coupled to a common ENABLE input, and having a common reference voltage output node (**101''**), each source including a first, p-channel (**102,102'**) and a second, n-channel (**103,103'**) CMOS transistor series-connected between Vcc and ground, said first and second transistors having respective gates connected at a common gate node (G, G') and respective drains connected to a common drain node (D, D'),

characterized in that:

said second reference voltage source (**101'**) is of relatively large capacity compared to said first source (**101**),

means (**173, 107'**), responsive to a rising signal edge at said ENABLE input, are provided for temporarily enabling said second source (**101'**), thereby shortening the time



required to drive the reference voltage at said output node (**101''**) to a desired level, i.e. enhancing the slew rate of said node, and

means (**190–194**) are provided for interconnecting said common gate nodes (G,G'), said common drain nodes (D,D'), and said common output reference voltage output node (**101''**) in response to a high signal on said ENABLE input and for isolating said nodes from one another in response to a low signal on said ENABLE input, thereby conserving power.

4,628,251

PRECISION MEASUREMENT VOLTAGE TRANSDUCER

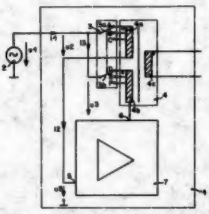
Muthis Halder, Baar, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed May 16, 1984, Ser. No. 611,018

Claims priority, application Switzerland, Jun. 1, 1983, 2994/83

Int. Cl.⁴ G05F *7/00*

U.S. Cl. 323—340 **19 Claims**



1. A precision measurement voltage transducer comprising

a reference voltage source providing an alternating voltage;

a servo amplifier having an input and an output;

a magnetic coupling means;

a feedback winding engaging the magnetic coupling means and feeding the reference voltage from the reference source to the input of the servo amplifier;

an output winding engaging the magnetic coupling means and having an output; and

a magnetizing winding engaging the magnetic coupling means and connecting the reference source voltage and the output of the servo amplifier, where the output of the servo amplifier is magnetically inductively engaging the feedback winding via the magnetizing winding such that the resulting input voltage of the servo amplifier is ap-

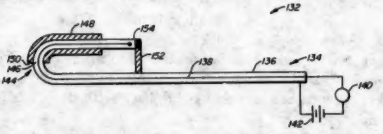
proximately zero and the voltage drop in the feedback winding is transformed into an output voltage at the output winding corresponding to the number of turns of the output winding and of the feedback winding.

4,628,252

CORROSIVE IMPURITY SENSOR

James H. Terhune, San Jose, and Gerald M. Gordon, Soquel, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Dec. 12, 1983, Ser. No. 560,121
Int. Cl.⁴ G01R *27/02*
U.S. Cl. 324—65 CR **1 Claim**



1. A sensor, in combination with an electrical source capable of delivering power to the sensor and meter means capable of indicating an electrical conduction produced by the sensor, for detecting the presence of at least one corrosive impurity in a fluid, the sensor comprising:

(a) a tube, bent to be stressed below its yield strength, provided with a weak groove area at the bend which is relatively weaker than the remainder of the tube, which tube is positioned in a fluid possibly having at least one impurity which if in sufficient concentration will cause the weak area to fracture; and

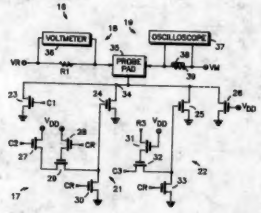
(b) a corrosion detecting element means, disposed within the tube, electrically connected to said electrical source, capable of conducting in the presence of at least one impurity if the tube fractures.

4,628,253

CLOCK SIGNAL TEST CIRCUIT

Ruey J. Yu, and William L. Martino, Jr., both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1984, Ser. No. 595,194
Int. Cl.⁴ G01R *15/12, 31/08;* H03K *5/13*
U.S. Cl. 324—73 R **15 Claims**



1. An integrated circuit for being tested by a test apparatus which is external to the integrated circuit, comprising:

serially connected first, second, and third clock drivers for sequentially providing, first, second, and third clock signals, respectively;

first current source means for passing current between a current node and a first power supply terminal in response to receiving the first clock signal;

second current source means for passing current between the current node and the first power supply terminal in response to receiving the second clock signal;

third current source means for passing current between the current node and the first power supply terminal in response to receiving the third clock signal; and

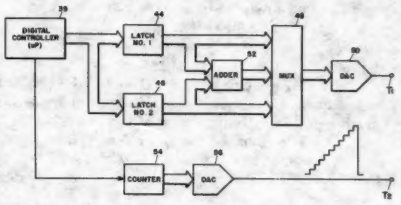
a probe pad coupled to the current node for providing a connecting point to the integrated circuit for the test apparatus which is external to the integrated circuit.

4,628,254

METHOD FOR DIGITALLY MEASURING WAVEFORMS

L. Rodney Bristol, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 16, 1984, Ser. No. 571,319
Int. Cl.⁴ G01R *23/16*
U.S. Cl. 324—77 R **5 Claims**



1. A method of digitally measuring a waveform display, comprising the steps of:

(a) adjusting the separation of a first pair of selected points on a waveform to a predetermined reference spacing by using a variable control;

(b) aligning first and second cursors with respective ones of a second pair of selected points on a waveform thereby to provide a measurement spacing; and

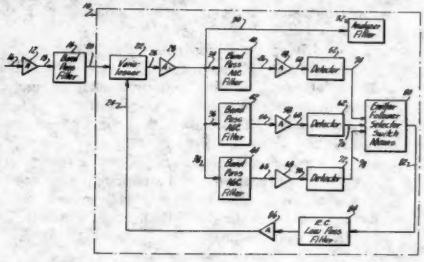
(c) determining by digital measurement means the ratio of said measurement spacing to said reference spacing.

4,628,255

AGC TECHNIQUE FOR SPECTRUM ANALYZERS

William O. Dunnican, Pompton Plains, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 8, 1969, Ser. No. 889,854
Int. Cl.⁴ G01R *23/165*
U.S. Cl. 324—77 C **5 Claims**



1. An automatic gain control system for use in a low frequency spectrum analyzer of the type having a band pass filter connected to receive RF signals having as components low frequency signals including background signals and higher intensity signals of discrete frequencies, and operative to pass a band of frequencies including a predetermined central frequency of interest, said system comprising:

vario-losser means for receiving signals throughout said band of frequencies and for providing a degree of attenuation of said signals in accordance with a control voltage;

RF amplifier means for receiving attenuated signals from said vario-losser means and for effecting amplification thereof, a portion of the amplified signals being taken as the output of said gain control system;

a plurality of narrow band pass filters for receiving and filtering amplified signals from said RF amplifier means, said filters including ones having peak transmittances close to and on both sides of said frequency of interest;

a plurality of detector means for receiving filtered signals from respective ones of said filter means and for rendering rectification of said filtered signals;

selector switch means for receiving the rectified outputs of each of said detector means and for selectively switching through only the lowest level input from said detector means;

low pass filter means for receiving the output of said selector switch means and for reducing ripple therein; and

D.C. amplifier means for receiving and amplifying the output of said low pass filter means to provide said control voltage to said vario-losser means.

4,628,256

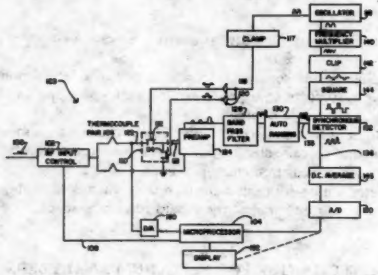
THERMOCOUPLE POWER METER

Robert Powell, Gaithersburg, Md., assignor to Weinschel Engineering Co., Inc., Gaithersburg, Md.

Filed Jun. 27, 1983, Ser. No. 508,090

Int. Cl.⁴ G01R *21/04, 19/24, 19/18*

U.S. Cl. 324—95 **30 Claims**



1. A meter for measuring an RF power, the meter comprising:

thermocouple means for converting RF power into a d.c. signal which varies with the RF power level;

means for establishing a sinusoidal signal having an offset from a reference level;

chopper means for receiving and chopping the d.c. signal; and

means for driving the chopper means with said offset sinusoidal input, the chopper means driven with said offset sinusoidal input providing an output signal that includes a series of sinusoidally-shaped, single-polarity pulses, the pulses varying in amplitude with the d.c. signal received by the chopper means; and

means for producing from said chopper means output signal, a signal at a predetermined harmonic frequency of said sinusoidal input, wherein the predetermined harmonic signal varies in amplitude with the amplitude of the chopper means output signal.

4,628,257

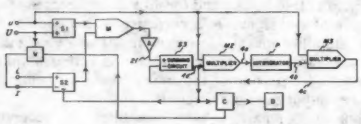
WATTMETER

Norbert L. Kusters, and Glen A. Herriot, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 26, 1984, Ser. No. 674,975

Int. Cl.⁴ G01R *17/02, 15/10, 5/22*

U.S. Cl. 324—142 **4 Claims**



1. In a wattmeter for determining power corresponding to a.c. voltage and current components from respective proportional representative a.c. signals u and i, comprising

(a) first source means for providing a d.c. voltage reference signal U,

(b) second source means for providing a d.c. current signal I,

(c) first summing means for adding together signals u and U to generate a first output,

(d) second summing means for adding together signals i and I to generate a second output,

(e) means for multiplying together said first and second outputs to generate a third output,

(f) a feedback line supplying said third output to the second summing means,

(g) control means acting on said second source means for adjusting the signal I to tend to bring said third output to zero, and

(h) display means responsive to the condition of the control means for providing an indication of the power to be determined,

comprising improvement of means for substantially eliminating from said feedback line an undesirable fundamental frequency a.c. ripple component that is in-phase with the signal u, said eliminating means comprising

(i) means for multiplying said third output with the signal u to generate a fourth output,

(j) means for integrating said fourth output to obtain a fifth output in the form of a d.c. signal proportional to said undesirable component,

(k) means for multiplying said fifth output with the signal u to generate a correction signal equal to and in-phase with said undesirable component, and

(l) means for injecting said correction signal with opposite polarity into the feedback line to substantially eliminate said component therefrom.

4,628,258

METHOD AND APPARATUS FOR ELECTRICAL TESTING OF MICROWIRED STRUCTURES WITH THE ASSISTANCE OF PARTICLE PROBES

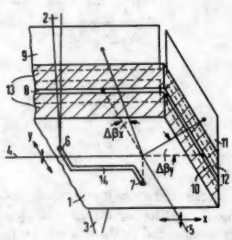
Burkhard Lischke, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 735,525

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420552

Int. Cl.⁴ G01R *31/02, 31/22;* **G06F** *11/32*

U.S. Cl. 324—158 P **14 Claims**



1. A method of testing microwired structures to determine if there is electrical continuity between first and second circuit nodes, comprising the steps of:

applying a first particle beam to the first node to charge the node and create an electric field at the second node when there is continuity between the two nodes;

directing a second particle beam past the second node resulting in deflection of the second particle beam in response to the presence of an electric field at the second node; and

detecting the deflection of the second particle beam as a measure of the voltage at the second node.

4,628,259

MAGNETO RESISTIVE SENSOR FOR DETECTING MOVEMENT OF A ROTATING BODY

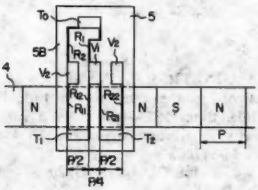
Tadashi Takahashi, Hitachi; Hiroshi Hayashida, Mito; Kunio Miyashita, and Sadao Sekizawa, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1981, Ser. No. 306,233

Claims priority, application Japan, Sep. 29, 1980, 55-134372; Oct. 9, 1980, 55-140502

Int. Cl.[4] G01B 7/14; G01R 33/02; H01L 41/12

U.S. Cl. 324—208 16 Claims



1. A rotation detecting means for a rotating body comprising:

a rotating body whose rotation state is to be detected;

a magnetic recording medium which is fixed to said rotating body centering around the center axis of said rotating body, N and S magnetic poles being alternately recorded at a prescribed interval on said recording medium in the rotation direction of said rotating body;

at least two groups of magnet-resistive elements disposed at a fixed position opposite to said magnetic recording medium so that their values of resistance may vary with the action of said magnetic poles as recorded on said magnetic recording medium, the widths of said magnet-resistive elements in the rotation direction being made sufficiently smaller than the pitch P of said magnetic poles recorded on said magnetic recording medium, said each group having two branches that comprise one magnet-resistive element, said two branches being disposed at an interval of an odd integer multiple of a minimum interval of P/2 in the rotation direction; and

low resistive parts comprising the parts which connect said two branches in series and the parts which connect said two groups in parallel to apply a prescribed voltage to each group so that output signals related to the rotation state of said rotating body may be derived from said connection parts of said two branches;

said magnet-resistive elements of each group being disposed in such a manner that the intervals between the groups of magnet-resistive elements are shifted from each other so that output signals have a phase difference.

4,628,260

EDDY CURRENT DEFECT-DETECTING SYSTEM FOR DETERMINING AN INNER OR OUTER DEFECT AND ITS DEPTH IN METAL TUBES

Sanshiro Kimoto, 1-4-32 Nakayamahigashi, Higashi-ku, Hiroshima-shi, Hiroshima-ken; Hisao Kokubo, 4-8-16 Tatsumidaihigashi, Ichihara-shi, Chiba-ken; Yasunobu Yamabayashi, 1-1 Yuushuudaihigashi, Ichihara-shi, Chiba-ken, and Kenichi Hidejima, 3-2 Yuushuudaihigashi, Ichihara-shi, Chiba-ken, all of Japan

Filed Oct. 19, 1983, Ser. No. 543,357

Claims priority, application Japan, Oct. 21, 1982, 57-185696

Int. Cl.[4] G01N 27/72, 27/82; G01R 33/12

U.S. Cl. 324—220 10 Claims

1. An eddy current defect-detecting system for a metal tube, comprising:

(a) a detector including test coil means movable axially through the metal tube for detecting as an impedance variation a variation in an eddy current produced due to a defect present in the metal tube;

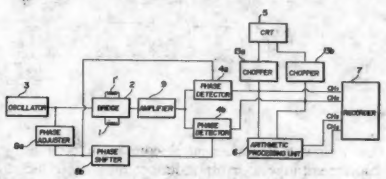
(b) an oscillator exciting said detector at a high frequency;

(c) a phase adjuster responsive to an oscillated output from said oscillator for adjusting the phase of the oscillated output to produce a first control signal;

(d) a phase shifter responsive to said first control signal from said phase adjuster for issuing a second control signal which is 90° out of phase with said first control signal;

(e) two phase detectors for producing a first X-axis defect signal by effecting first phase detection on an output signal from said detector with said first control signal and a second Y-axis defect signal by effecting second phase detection on the output signal from said detector with said second control signal;

(f) an arithmetic processing unit for electrically reading amplitudes of said first and second defects signals from said two phase detectors to determine phase angles thereof indicative of whether the defect is on an inner surface or an outer surface and of the depth of the defect, said arithmetic processing unit determining the phase angle θ of said Y-axis signal when the amplitude of said Y-axis signal exceeds a



predetermined value and said arithmetic processing unit determining whether said Y-axis signal is positive or negative when a half amplitude of the Y-axis signal is at least half of said predetermined value, said phase angle $\theta=\tan^{-1}|Y|/|X|$ or $\theta=180°-\tan^{-1}|Y|/|X|$, a calculated phase angle in a first range indicating that the defect is on an inner surface and a phase angle in a second range, different from said first range, indicating that the defect is on an outer surface, said arithmetic processing unit providing a first defect-indicating output signal proportional to the calculated phase angle when an inner surface defect is detected and providing a second defect-indicating output signal proportional to the calculated phase angle when an outer surface defect is detected; and

(g) recorder means for separately recording signals from said arithmetic processing unit which are representative of the defect on the inner surface and the depth thereof or the defect on the outer surface and the depth thereof, said first defect-indicating output signal being issued to one channel of said recorder means and said second defect-indicating output signal being issued to a second channel of said recorder means.

4,628,261

METHOD AND APPARATUS FOR SEPARATING MAGNETIC FIELD ATTRIBUTABLE TO FLAWS IN A MATERIAL FROM MAGNETIC FIELDS ATTRIBUTABLE TO OTHER PHENOMENA

Gerhard Hüschelrath, Laufach-Frohnhofen, and Ursula Ruth, Ronneburg, both of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Apr. 5, 1983, Ser. No. 482,284

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1982, 3213267

Int. Cl.[4] G01N 27/90; G01R 33/12

U.S. Cl. 324—240 14 Claims

8. An apparatus for detecting flaws in electrically conductive material comprising:

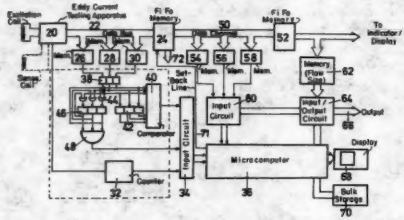
means for inducing magnetic fields in a material to be tested

for flaws, thereby causing eddy currents to flow in said material;

means for detecting the magnetic fields, induced by said inducing means, in proximity to said material and producing eletrical signals in response thereto;

means for converting said electrical signals, received from said detecting means, to at least one initial digital value representing a complex number;

means for characterizing said initial value, received from said converting means, as included in one or more of three ranges, a value included in a first of said three ranges corresponding to a field produced by phenomena other than a flaw in said material, a value included in a second of said three ranges corresponding to a field produced in part by a flaw in said material and in part by phenomena other



than a flaw in said material, a value included in a third of said three ranges corresponding to a field produced only by a flaw in said material;

means for removing components attributable to phenomena other than a flaw in said material from said initial value, received from said characterizing means, to produce a processed value if said characterizing means characterizes said initial value as included in said second range; and

means for determining parameters of a flaw in said material in response to said initial value if said characterizing means characterizes said initial value as being included in said third range and in response to said processed value produced by said removing means if said characterizing means characterizes said initial value as being included in said second range.

4,628,262

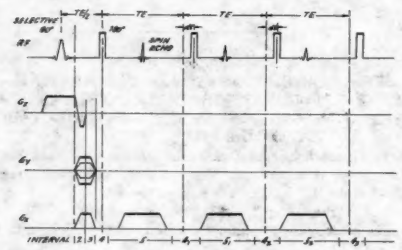
MULTIPLE ECHO CHEMICAL SHIFT IMAGING

Andrew A. Maudsley, Boston, Mass., assignor to Advanced NMR Systems, Inc., Woburn, Mass.

Filed Feb. 5, 1985, Ser. No. 697,972

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **18 Claims**



1. A method of acquiring NMR information, comprising:

exciting at least some of the atoms of an object;

providing a plurality of refocusing pulses, each for generating a respective spin echo signal; after each refocusing pulse, providing a corresponding observation gradient field during the respective spin echo signal for spatially encoding the excited atoms; providing the plurality of refocusing pulses comprising timing at least one of the refocusing pulses in relation to the corresponding observation gradient field for spectrally encoding the excited atoms, thereby causing the excited atoms to provide both spatial and spectral information in the respective spin echo signal; and

after at least one of the refocusing pulses, receiving the respective spin echo signals from the object.

4,628,263

NUCLEAR MAGNETIC RESONANCE SPECTROMETER

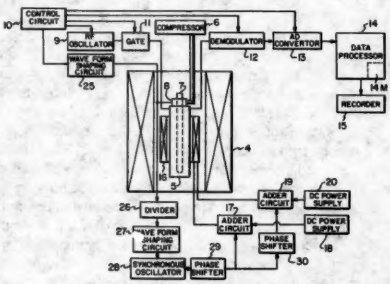
Jun Kida, Tokyo, Japan, assignor to Jeol Ltd., Tokyo, Japan

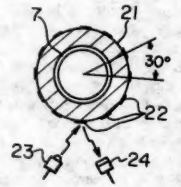
Filed Jun. 11, 1984, Ser. No. 619,005

Claims priority, application Japan, Jun. 13, 1983, 58-105386; Aug. 12, 1983, 58-147885

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—321 **5 Claims**





1. A nuclar magnetic resonance spectrometer having a means for producing a static magnetic field in the direction of Z-axis, a means for rotating a sample tube holding a sample therein in the magnetic field about the Z-axis, and a means for irradiating the sample with radio-frequency pulses and detecting the free induction decay signal emitted from the sample after the irradiation, said nuclear magnetic resonance spectrometer comprising:

a means for sensing the angular position of the sample tube; and

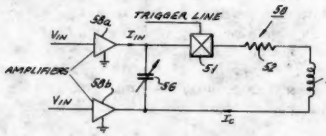
a means for adding the free induction decay signals;

wherein the radio-frequency pulses are applied according to the output signal from the angular position sensing means when a certain location of the sample tube arrives at a first specific position and also when the certain location arrives at a second position diametrically opposite to the first position, whereby two free induction decay signals are added by the adding means.

4,628,264
NMR GRADIENT FIELD MODULATION

Richard R. Rzedzian, Lexington, Mass., assignor to Advanced NMR Systems, Inc., Woburn, Mass.

Filed Mar. 14, 1984, Ser. No. 589,539
Int. Cl.[4] G01R *00/00*
U.S. Cl. 324—322 **32 Claims**



1. A circuit for generating a gradient field for a nuclear magnetic resonance imaging system comprising:

input power circuitry for providing input power;

a capacitive circuit connected to the input power circuitry for storing energy in response to the input power;

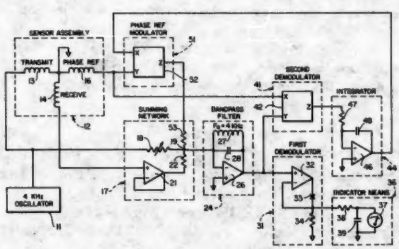
a gradient coil; and

circuitry for connecting the gradient coil to the capacitive circuit, the gradient coil and the capacitive circuit when connected by the connecting circuitry being resonant at a resonant frequency to exchange energy in a sinusoidal manner at the resonant frequency for providing a sinusoidally modulated gradient field; the input power circuitry being operable for providing input power at about the resonant frequency to maintain the sinusoidally modulated gradient field at about a constant amplitude; the connecting circuitry comprising a switch circuit connected between the capacitive circuit and the gradient coil for closing and opening a switched connection therebetween to begin and end a sinusoidal exchange of energy for providing the sinusoidally modulated gradient field.

4,628,265
METAL DETECTOR AND CLASSIFIER WITH AUTOMATIC COMPENSATION FOR SOIL MAGNETIC MINERALS AND SENSOR MISALIGNMENT

David E. Johnson, Los Banos, and Richard W. Williams, Dos Palos, both of Calif., assignors to FRL, Inc., Los Banos, Calif.

Filed Apr. 22, 1983, Ser. No. 487,699
Int. Cl.[4] G01V *3/08, 3/10*; G01N *33/12*; G01R *27/72*
U.S. Cl. 324—329 **13 Claims**

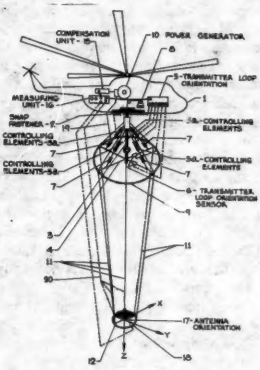


1. In apparatus for locating a metal object: a transmitting coil, means for applying a square wave excitation voltage to the transmitting coil to transmit an alternating magnetic field, a receiving coil located within the transmitted field for producing a signal having components of different phases corresponding to metal objects and other disturbances in the field, first and second synchronous demodulators for demodulating the received signal at the phase of the transmitted field and in quadrature with the phase of the transmitted field, means for providing a square wave signal in quadrature with the transmitted field, an integrator for providing a signal of generally triangular waveform in response to the square wave signal in quadrature with the transmitted field, means for clipping the triangular signal to provide a sinusoidal signal at the fundamental frequency of the magnetic field, means for applying the sinusoidal signal to the first demodulator, a differentiator responsive to the sinusoidal signal for providing a signal which is shifted in phase by 90 degrees with respect to the sinusoidal signal, means for applying the phase shifted signal to the second demodulator, means responsive to one of the demodulated signals for indicating the presence of a metal object in the field, a bandpass filter responsive to the received signal for passing a signal corresponding to the third harmonic of the received signal, a third synchronous demodulator for demodulating the third harmonic signal at the phase of the transmitted field, means for applying a reference phase signal to the third demodulator at the phase of the transmitted field, means for integrating the demodulated third harmonic signal, means responsive to the integrated signal for proving a correction signal in phase with the transmitted field, and means for combining the correction signal with the received signal to null out a component of said signal of the phase of the transmitted field.

4,628,266
APPARATUS FOR DIRECT AIRBORNE ELECTROMAGNETIC PROSPECTING OF HYDROCARBON DEPOSITS.

Jan Dzwinel, Krakow, Poland, assignor to Instytut Gornictwa Naftowego, Krakow, Poland

Division of Ser. No. 385,228, Jun. 4, 1982. This application Jan. 17, 1985, Ser. No. 693,002
Claims priority, application Poland, Jun. 10, 1981, 231633
Int. Cl.[4] G01V *3/165, 3/16*
U.S. Cl. 324—330 **1 Claim**



1. A helicopter mounted apparatus for direct electromagnetic prospecting of hydrocarbon deposits comprising in combination a transmitting system, a receiving system, and a processing system, wherein:

(a) the transmitting system consists of a high power generator mounted on a helicopter board which supplies alternating current in the frequency range of 0.1 to 10 Hz through a supply cable to an induction transmitter loop consisting of a large number of windings of a single insulated conductor,

(i) said transmitter loop being suspended vertically beneath the helicopter by means of a snap fastener, a shaft with an articulated joint, and a supporting frame,

(ii) said shaft extending vertically below the helicopter and being connected to the helicopter via said snap fastener, and the lower end of said shaft being rigidly, orthogonally connected to said supporting frame,

(iii) said supporting frame consisting of two crossed bars at whose ends said transmitter loop is rigidly connected,

(iv) said articulated joint on said shaft enabling said frame and said transmitter loop to be oriented in any direction and at any angle, such orientation being achieved with a controlling assembly consisting of a transmitter loop orientation controller, controlling elements, loop orientation sensors, and shock absorbers,

(v) said orientation controller mounted on the helicopter board and connected to a microprocessor also mounted on the helicopter board, said microprocessor controlling the entire apparatus and sending signals of predetermined orientation characteristics to said orientation controller, and said orientation controller in turn sending signals to said controlling elements,

(vi) said controlling elements mounted on arms which connect the shaft to said support frame, and adjusting the relative length of said arms to obtain the desired orientation,

(vii) said loop orientation sensors mounted on said supporting frame and continuously sending signals of the actual orientation back to said orientation controller, which in turn continuously adjusts the signal to the controlling elements,

(viii) said shock absorbers being mounted on the arms connecting the shaft to said support frame, and

(ix) the signal from said loop orientation sensors being sent to said microprocessor as one input to be stored;

(b) the receiving system consisting of three orthogonal induction receiver antennae each consisting of two circuits wound on a permalloy core, one a measuring circuit to measure the deviation of phase and amplitude of one of the three components H_x, H_y, H_z of said primary electromagnetic fields, and the other a compensation circuit which is used to compensate for the deviation of phase and amplitude signals measured by said inducation receiver antennae over locations known not to contain hydrocarbons (reference locations),

(i) said induction receiver antennae being rigidly attached to a horizontal aerodynamic shield, said aerodynamic shield stabilizing said induction receiver antennae while in flight and being suspended vertically from the transmitter loop supporting frame by means of steel lines,

(ii) signals received by the induction receiver antennae over said reference locations for all combinations of transmitter induction loop orientation, frequency, and helicopter altitude being transmitted to the microprocessor via measuring cables and stored in magnetic storage controlled by said microprocessor, and when flights are performed over locations for which it is to be determined whether or not hydrocarbons occur (prospecting locations), signals being sent to the compensation circuits from said microprocessor to compensate for the signals previously obtained over said reference locations, and

(iii) the orientation of said inducation receiver antennae being sensed by antennae orientation sensors mounted on one of said inducation receiver antennae, said antennae orientation sensors generating a signal which is sent via an additional measuring cable to said microprocessor and then stored on said magnetic storage;

(c) the processing system consisting of a digital meter assembly, a microprocessor, magnetic storage, and a monitor,

(i) said digital meter assembly being located on the helicopter board and accepting as input the signals of the compensated phase and amplitude from said measuring circuits of said induction receiver antennae, the orientation of said induction transmitter loop as sensed by said loop orientation sensors, the orientation of said induction receiver antennae as sensed by said antennae orientation sensors, the helicopter altitude and geographic co-ordinates as measured by standard helicopter instruments,

(ii) said microprocessor being located on the helicopter board and being linked electronically to the transmitting system, receiving system, and digital meter assembly, and controlling the generator output and the orientation of said transmitting induction loop, and

(iii) said microprocessor also gathering and storing in said magnetic storage the signals of phase and amplitude from said measuring circuits of said induction receiver antennae, the helicopter altitude, the frequency of the signal supplied to said transmitting induction loop, the orientation of said induction receiver antennae, and the geographic co-ordinates of the helicopter, and

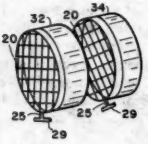
(iv) said microprocessor processing this data to obtain a probability level of hydrocarbon occurrence over each said prospecting location on the basis of pattern recognition theory and displaying said probability level on said monitor located in the helicopter, or alternately, said processing being performed after the helicopter lands by a second microprocessor on the ground and plotting a map of probability contours from data obtained over all said prospecting locations.

4,628,267

MEASURING OF ELECTRICAL CHANGES INDUCED BY IN SITU COMBUSTION THROUGH FLOW-THROUGH ELECTRODES IN A LABORATORY SAMPLE OF CORE MATERIAL

David O. Lee; Paul C. Montoya, and James R. Wayland, Jr., all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 15, 1983, Ser. No. 485,154
Int. Cl.[4] G01V 3/02
U.S. Cl. 324—376 **11 Claims**



1. Apparatus for obtaining dynamic electrical parameter data for a core of material, said apparatus comprising:

a plurality of test electrodes, each electrode including structural means for permitting nondestructive passage of a phase front therethrough;

a plurality of reconstituted core material samples; and

housing means defining a combustion tube for holding an alternating pattern of said core material samples and said test electrodes;

the electrical impedance between two of said test electrodes providing accurate dynamic characteristics of said core material throughout the passage of the phase front.

4,628,268

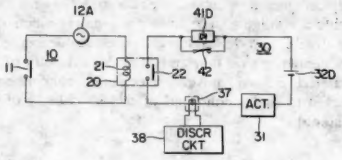
TEST DEVICE FOR TESTING AN ACTUATOR CIRCUIT

Takehiro Matsubara, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1983, Ser. No. 534,300
Claims priority, application Japan, Nov. 18, 1982, 58-204145
Int. Cl.[4] G01R 31/32
U.S. Cl. 324—418 **10 Claims**

1. A test device for testing an actuator circuit when the actuator in the circuit is turned off to determine whether the circuit is operating normally, the actuator circuit having an actuator power supply and a relay output in series with said actuator, said test device comprising a test circuit including a test circuit power supply, a relay input actuated by said test circuit power supply under test conditions and coupled to operate said relay output to connect said actuator power supply to said actuator, voltage limiting means in said actuator circuit for limiting the voltage applied to said actuator from said actuator power supply under test conditions when said relay output is operated, means for detecting characteristics of

current flow in said actuator circuit under test conditions and for discriminating between normal and abnormal circuit operation, and means connected in parallel with said voltage limiting means for bypassing said voltage limiting means except under test conditions.

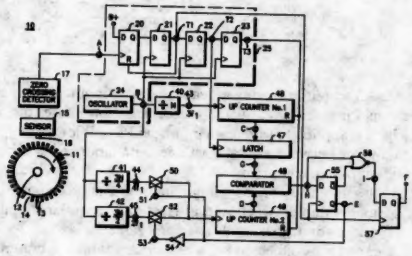


4,628,269

PULSE DETECTOR FOR MISSING OR EXTRA PULSES

Roy Hunninghaus, Des Plaines, and Edward Q. Almquist, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 23, 1984, Ser. No. 613,654
Int. Cl.[4] H03K *5/19, 5/26*
U.S. Cl. 328—120 **23 Claims**



1. A pulse detector for producing a pulse detection output signal in response to either an absence of a pulse or an occurrence of an extra pulse in a variable frequency periodic pulse train signal, said detector comprising:

first means for receiving a variable frequency periodic pulse train signal, comprising periodic pulses having a predetermined repetition rate, and providing an arming output signal in response to a second time duration between successive pulse train pulses which exceeds in one polarity sense by a first predetermined amount a first preceding time duration between successive pulse train pulses, and

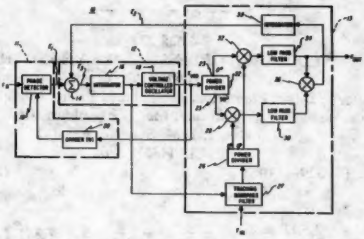
second means coupled to said first means for receiving said arming output signal and providing a pulse detection output signal in response to the providing of said arming output signal and a third time duration, between successive pulse train pulses subsequent to said second time duration, which exceeeds in an opposite polarity sense, by a second predetermined amount, said second time duration, whereby the occurrence of a missing or extra pulse indicated by said pulse detection output signal is more readily distinguishable from a reduction or increase in the predetermined repetition rate of the periodic pulses in the variable frequency periodic pulse train signal.

4,628,270

FREQUENCY-AGILE SYNCHRONOUS DEMODULATOR

Richard D. Roberts, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 10, 1985, Ser. No. 721,747
Int. Cl.[4] H03D *3/02*
U.S. Cl. 329—50 **37 Claims**



1. A frequency-agile synchronous demodulator for demodulating a carrier signal modulated by an information signal, wherein said frequency-agile synchronous demodulator is tunable for demodulating any modulated carrier signal within a band of carrier frequencies, and wherein said frequency-agile synchronous demodulator comprises:

means for providing an oscillating signal;

processor means responsive to said oscillating signal and the modulated carrier signal for producing a first signal representing the phase difference between said oscillating signal and the modulated carrier signal;

means for receiving a frequency-reference signal, having a frequency related to the frequency of the modulated carrier signal which it is desired to demodulate;

phase detector means responsive to said frequency-reference and said oscillating signals for producing a second signal representing the phase difference between said frequency-reference and said oscillating signals; and

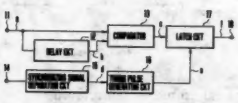
wherein said means for providing said oscillating signal is responsive to said first and second signals for controlling the frequency and phase of said oscillating signal to lock said oscillating signal to the frequency and phase of the desired modulated carrier signal for demodulation thereof.

4,628,271

DIFFERENTIAL PHASE SHIFT KEYING DEMODULATOR

Makoto Takayama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1984, Ser. No. 667,015
Claims priority, application Japan, Nov. 2, 1983, 58-206443; Nov. 2, 1983, 58-206446
Int. Cl.[4] H04L *27/22*
U.S. Cl. 329—50 **18 Claims**



1. A differential phase shift keying demodulator, comprising:

(a) delay means for delaying a modulated signal, the delay time of said delay means being set at a value which is an integral number times as much as the period of the carrier wave of said modulated signal, and the delay time being shorter than a transmission period for one bit of said modulated signal; and

(b) comparison means for comparing an output signal of said delay means and the modulated signal.

4,628,272

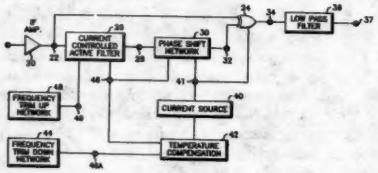
TUNED INDUCTORLESS ACTIVE PHASE SHIFT DEMODULATOR

Walter L. Davis, Plantation, and Yolanda Prieto, Miami, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1984, Ser. No. 655,822

Int. Cl.[4] H03D *3/02*

U.S. Cl. 329—110 **23 Claims**



1. An inductorless quadrature demodulator for demodulating a frequency modulated (FM) signal which deviates in frequency about a center frequency, comprising:

inductorless active phase shifting means receiving said FM signal, for shifting the phase of said FM signal linearly over a predetermined range of frequencies about said center frequency to produce a quadrature signal, said inductorless active phase shifting means having a Q factor greater than 1;

frequency adjusting means, coupled to said inductorless active phase shifting means, for adjusting the frequency at which said quadrature signal is produced; and

phase detecting means, having an output node, for detecting a difference in phase between said FM signal and said quadrature signal and for producing a signal varying with said difference in phase at said output node.

4,628,273

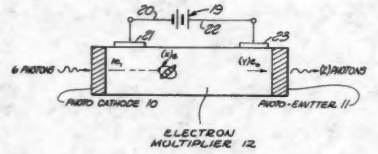
OPTICAL AMPLIFIER

Weldon R. H. Vlasek, Van Nuys, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 12, 1933, Ser. No. 560,631

Int. Cl.[4] H01S *3/00*; G02B *6/14*; H01J *43/04*

U.S. Cl. 330—4.3 **12 Claims**



1. An optical amplifier comprising:

a solid body of intrinsic material adapted to produce secondary emission upon electron bombardment thereof;

a photocathode deposited by doping to a first end of said solid body of intrinsic material;

a photo-emitter deposited by doping to a second end of said solid body of intrinsic material; and

means to establish a potential gradient lengthwise across said solid body of intrinsic material between said first end and said second end thereof such that said second end adjacent said photo-emitter is more positive than said first end adjacent said photocathode, said potential gradient means being a voltage source having a negative electrode and a positive electrode, said negative electrode being directly connected to said first end of said solid body of intrinsic material and said positive electrode being directly connected to said second end of said solid body of intrinsic material.

4,628,274

AMPLIFIER WITH INPUT DRIFT VOLTAGE COMPENSATION

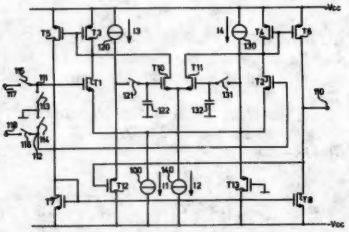
Eric A. Vittoz, Cernier, and Henri J. Oguey, Corcelles, both of Switzerland, assignors to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Apr. 30, 1985, Ser. No. 728,883

Claims priority, application Switzerland, Apr. 4, 1984, 2179/84

Int. Cl.[4] H03F *1/14*

U.S. Cl. 330—9 **7 Claims**



1. An amplifier having at least one main input, an output and means for nullifying, during a compensation phase, the signal which is applied to said main input, said amplifier having a first gain value between said at least one main input and said output, said amplifier comprising:

at least one secondary input having a substantially lower gain value between said at least one secondary input and said output, than said first gain value;

a capacitor connected between a point which is common to said secondary input and a point at a fixed potential;

switch means which are disposed between the output of the amplifier and the point which is common to said capacitor and to said secondary input and which permit the voltage level of the output of the amplifier to be stored in said capacitor during said compensation phase; and

compensation means which are controlled by said stored voltage level to compensate for the effect of the drift voltage of said main input.

4,628,275

EFFICIENT POWER AMPLIFIER FOR HIGH CAPACITIVE DEVICES

John D. Skipper, and Steven M. Long, both of Albuquerque, N. Mex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 29, 1985, Ser. No. 759,717

Int. Cl.[4] H03F *3/38*

U.S. Cl. 330—10 **14 Claims**

1. A power amplifier circuit for driving a high-capacitive device, comprising:

a load string including inductive means connected to said device;

capacitive means connected to said load string, wherein during operation of said circuit said inductive means ex-

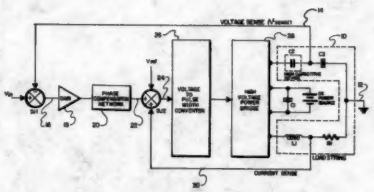
changes energy between said device and said capacitive means;

a dc power source for charging said capacitive means;

means for producing a full wave alternating triangular waveform of current in said load string including,

current sensing means connected to said load string, and

comparing means connected to said current sensing means for comparing current circulating in said load string to equal and opposite polarity reference levels so that



equal charge is alternately removed from said capacitive means and delivered to said device through said inductive means then returned to said capacitive means with any losses replenished by said dc power source;

means connected to said load string for sensing charge contained in said high capacitive device and to modulate said full wave alternating triangular current waveform;

whereby, said amplifier behaves as a stable linear dc coupled single pole operational amplifier delivering a large reactive current with only slight losses.

4,628,276

LOGARITHMICALLY LINEARLY CONTROLLED VARIABLE GAIN AMPLIFIER

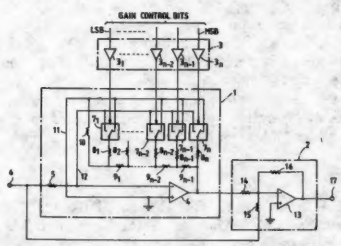
Mikio Mizutani, Tokyo, Japan, assignor to Matsushita Graphic Communications Systems, Inc., Japan

Filed Dec. 14, 1984, Ser. No. 682,596

Claims priority, application Japan, Dec. 15, 1983, 58-236695; Aug. 18, 1984, 59-171997

Int. Cl.⁴ H03G *3/20*

U.S. Cl. 330—86 **13 Claims**



9. A variable gain amplifier comprising:

an input terminal and an output terminal;

divider means having a first input connected to said input terminal to receive an analog input signal and a second input to which an n-bit digital gain control signal having a gain control value x is applied for dividing said analog input signal by the control value x;

subtractor means having a first input connected to an output of said divider means and a second input connected to said input terminal, the subtractor means providing to said output terminal an analog output signal, whereby the ratio of the analog input signal to the analog output signal is $(2^n/x)-1$ which approximates a logarithmically linear function of said control signal, said divider means comprising:

an operational amplifier having an input connected to said input terminal; and

a feedback circuit including a variable resistance means connected from the output of said operational amplifier to an input of said operational amplifier, the variable resistance means being responsive to said gain control signal to vary the resistance value of the feedback circuit; said resistance means comprising a ladder network having a series of first resistors connected from the output of the amplifier and a plurality of second resistors, each of said second resistors having a first end and a second end, the first end of each of said second resistors being connected respectively to said first resistors, a like plurality of switches selectively connecting the second ends of said second resistors to the input of said operational amplifier in response to binary signals representing said gain control signal, wherein the resistance value of each of said second resistors is twice as high as the resistance value of each of said first resistors.

4,628,277

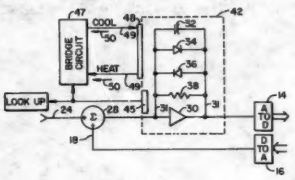
FEMTOAMMETER

William D. Hill, San Jose, and David D. Akers, Los Gatos, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed May 1, 1985, Ser. No. 729,455

Int. Cl.⁴ H03F *1/34*

U.S. Cl. 330—110 **7 Claims**



1. A femtoammeter comprising in combination:

an amplifier having a first leg connected to an input and a second leg to a reference standard voltage;

said amplifier having an output and a feedback loop from said output to said input leg;

first and second log diodes placed in parallel across said feedback loop, said first diode being opposed in direction to said second diode, said respective diodes being provided in a heat sink to maintain said diodes at a relatively constant temperature;

at least one temperature sensor connected to said heat sink, said temperature sensor outputting a signal to indicate in real time the operating temperature of said amplifier for calibrating said amplifier output in real time.

4,628,278

LOW EVEN-ORDER HARMONIC DISTORTION AMPLIFIER AND METHOD

Jeffrey S. Bottman, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Jun. 28, 1984, Ser. No. 625,547

Int. Cl.⁴ H03F *1/32*

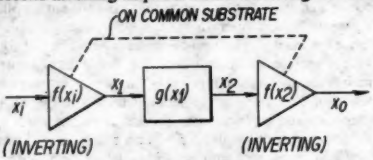
U.S. Cl. 330—149 **13 Claims**

1. Apparatus for amplifying an input signal which comprises:

(a) first inverting amplifier means exhibiting a non-linear amplifying characteristic having an input adapted to be coupled to the input signal for providing a first signal at a first output which is based on the input signal amplified by a first gain;

(b) attenuator means having an input coupled to said first output for providing a second signal at a second output which is based on said first signal attenuated by an attenuation factor substantially equal to said first gain; and

(c) second inverting amplifier means exhibiting a non-linear



amplifying characteristic substantially similar to that exhibited by said first inverting amplifier means having an input coupled to said second output for providing an output signal at a third output which is based on said second signal amplified by a second gain substantially equal to said first gain.

4,628,279

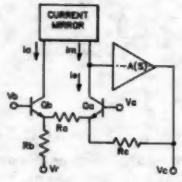
WIDEBAND FEEDBACK AMPLIFIER

David A. Nelson, Loveland, Colo., assignor to Comlinear Corporation, Fort Collins, Colo.

Filed Dec. 26, 1985, Ser. No. 813,590

Int. Cl.[4] H03F 3/45

U.S. Cl. 330—257 **10 Claims**



1. A wideband feedback amplifier, the amplifier comprising:

first transistor means having at least first, second, and third terminals, the first terminal of which is connected to receive a first input signal;

second transistor means having corresponding first, second, and third terminals, the first terminal of which is connected to receive a second input signal;

a first resistance connected between the second terminal of said first transistor means and the second terminal of said second transistor means;

a second resistance connected between the second terminal of said first transistor means and a third input signal;

inverting gain means having an input connected to the third terminal of said second transistor means and having an output;

a third resistance connected between the second terminal of said second transistor means and the output of said inverting gain means; and

current mirror means having a first terminal connected to the third terminal of said first transistor means and having a second terminal connected to the third terminal of said second transistor means for supplying a current to the third terminal of said second transistor means that is equal to a current flowing into the third terminal of said first transistor means.

4,628,280

AMPLIFIER ARRANGEMENT

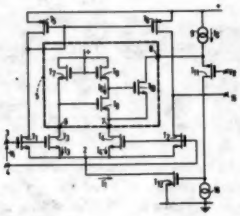
Evert Seevinck, Delden, and Roelof F. Wassenaar, Enschede, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 9, 1985, Ser. No. 764,142

Claims priority, application Netherlands, Aug. 20, 1984, 8402541

Int. Cl.[4] H03F 3/45

U.S. Cl. 330—259 **15 Claims**



1. An amplifier arrangement comprising:

a first transistor and a second transistor of the same conductivity type each of which comprise a control terminal for receiving an input signal, a first main terminal and a second main terminal, the first main terminals being coupled to a common terminal, and

means for applying to the common terminal a bias current which depends on the input signal, said means comprising a third transistor and a fourth transistor each of which comprise a control terminal and a first and a second main terminal, currents in the third and fourth transistors being related to currents in the first transistor and in the second transistor, respectively,

characterized in that, the bias current applying means further comprise:

means for generating a control signal which is a measure of the difference between a reference current and the smaller of the currents in the third transistor and the fourth transistor, and

negative-feedback means which minimize the control signal from the control-signal generating means by controlling the bias current applied to the common terminal.

4,628,281

FEEDBACK AMPLIFIER WITH REDUCED DISTORTION

Adrianus Sempel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1985, Ser. No. 798,081

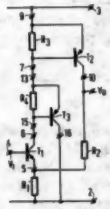
Claims priority, application Netherlands, Nov. 22, 1984, 8403549

Int. Cl.[4] H03F 3/04

U.S. Cl. 330—288 **4 Claims**

1. An amplifier arrangement having an input and an output and comprising, between a first and a second power-supply terminal, a first transistor having a control terminal coupled to the input of the amplifier arrangement, a first main terminal connected to a first end of a first resistor whose second end is coupled to the first power-supply terminal, and a second main terminal coupled to an input terminal of a first current multiplier circuit which multiplier circuit has an output terminal for supplying the multiplied input current and a sum terminal for

supplying the sum of the currents in the input terminal and the output terminal, which sum terminal is coupled to the input terminal of a second current multiplier circuit which has an output terminal for supplying the multiplied input current and a sum terminal for supplying the sum of the currents in the input terminal and the output terminal, which sum terminal is coupled to the second power-supply terminal, characterized in



that the output terminal of the second current multiplier circuit is connected to the first end of the first resistor via a second resistor and the output of the amplifier arrangement is connected to that end of the second resistor which is remote from the first end, and in that the output terminal of the first current multiplier circuit is directly connected to the first power-supply terminal.

4,628,282

CLOCK GENERATOR FOR DIGITAL DEMODULATORS

Kazuo Hikawa, Tokyo; Kazuya Toyomaki, Zama, and Hiroyuki Yamazaki, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 28, 1985, Ser. No. 717,094

Claims priority, application Japan, Mar. 30, 1984, 59-62849

Int. Cl.[4] H03L *7/00*

U.S. Cl. 331—1 A **19 Claims**

1. A clock generator adapted to receive a digital bit stream, comprising:

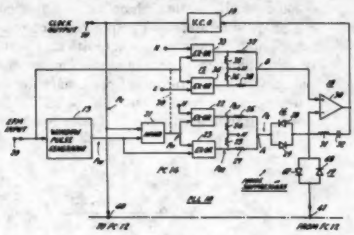
a voltage-controlled oscillator for generating clock pulses having a frequency and a phase which are variable in response to an input signal applied thereto;

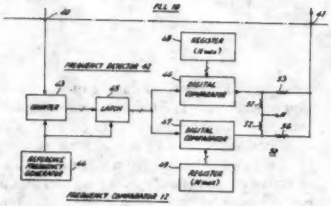
means for generating a window pulse having a pulse duration smaller than the pulse spacing of said clock pulses in response to a predetermined transition between binary "1" s and binary "0" s in said bit stream;

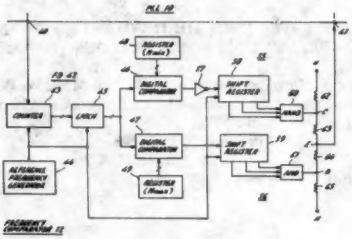
a phase comparator responsive to said window and clock pulses for generating a phase control signal representing the difference in phase between said window pulse and said clock pulse;

a frequency comparator responsive to said clock pulse for detecting whether the frequency of said clock pulse is below a lower limit of a predetermined range or above an upper limit thereof and producing a frequency control signal of different levels depending on whether said frequency is below said lower limit or above said upper limit; and

means for combining said phase control signal and said frequency control signal and applying the combined sig-







nals to said voltage-controlled oscillator as said input signal.

4,628,283

HERMETICALLY SEALED OSCILLATOR WITH DIELECTRIC RESONATOR TUNED THROUGH DIELECTRIC WINDOW BY ADJUSTING SCREW

Allan Reynolds, Flushing, N.Y., assignor to The Narda Microwave Corporation, Hauppauge, N.Y.

Filed Nov. 7, 1983, Ser. No. 548,924

Int. Cl.[4] H03B *5/02, 7/00*; H01P *7/10*

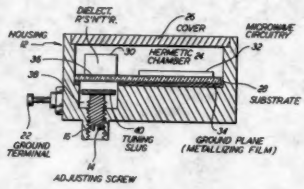
U.S. Cl. 331—68 **35 Claims**

1. In a microwave resonator apparatus of the class comprising a dielectric resonator puck having a microwave natural frequency, a driving circuit for exciting the puck to resonate at its natural frequency and develop a microwave field thereabout, and a mechanically movable tuning member arranged to be moved selectively into different positions of interference with a portion of said microwave field, thereby to cause the frequency at which the puck resonates when excited by said driving circuit to deviate from said natural frequency as a function of the tuning member's interference with said microwave field portion, the improvement wherein:

the dielectric resonator puck and the driving circuit are jointly housed within a hermetically sealed chamber from which the mechanically movable tuning member is ex-

cluded in order to maintain the hermetic integrity of said chamber;

the hermetically sealed chamber is bounded by material which is substantially opaque to microwave fields and which, in a manner consonant with said hermetic integrity of said chamber, is provided with microwave field transparency in a region thereof proximate the dielectric resonator puck in order to transmit out of said chamber said portion of the microwave field developed about said puck; and



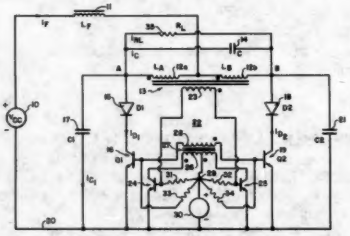
the mechanically movable tuning member is located in relation to said region of field transparency and the transmission path therethrough of said portion of the microwave field developed about the dielectric resonator puck so as to effect said deviation from said natural frequency by the selective movement of said tuning member into said different positions of interference with said microwave field portion.

4,628,284

HIGH FREQUENCY HIGH VOLTAGE POWER SUPPLY PREVENTING SIMULTANEOUS TRANSISTOR CONDUCTION

Gert W. Bruning, Tuckahoe, N.Y., and Mark W. Fellows, Buffalo Grove, Ill., assignors to North American Philips Corporation, New York, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,461
Int. Cl.[4] H03B 9/10
U.S. Cl. 331—86 **13 Claims**



1. A solid state power oscillator comprising:

a pair of input terminals for connection to a current source,

a parallel resonant tank circuit comprising a primary winding of a transformer connected in parallel with a first capacitor,

first and second diodes,

first and second switching transistors,

means connecting the first diode and the first transistor in a first series circuit between a first end terminal of the tank circuit and a first of said input terminals,

means connecting the second diode and the second transistor in a second series circuit between a second end terminal of the tank circuit and said first input terminal,

a second capacitor coupled in parallel with the first series circuit,

a third capacitor coupled in parallel with the second series circuit,

means connecting a tap on the primary winding to a second of said input terminals, and

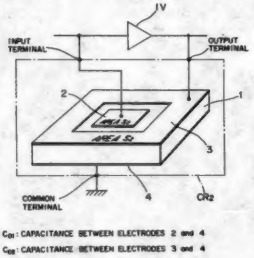
a drive circuit including a secondary winding of said transformer and coupled to control electrodes of the first and second transistors for supplying drive signals thereto so as to alternately switch the transistors on and off in push-pull operation and with a forced switching delay such as to provide a dead-time wherein both transistors are simultaneously off during the switching interval of the transistors.

4,628,285

3-TERMINAL OSCILLATING ELEMENT AND OSCILLATOR EMPLOYING THE SAME

Hiroshi Nakatani, Kanazawa; Jiro Inoue, Ishikawa, and Masashige Miyamori, Hakui, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation-in-part of Ser. No. 441,644, Nov. 15, 1982. This application Dec. 27, 1984, Ser. No. 686,010
Claims priority, application Japan, Nov. 16, 1981, 56-184194
Int. Cl.[4] H03B 5/32
U.S. Cl. 331—163 **5 Claims**



1. A 3-terminal oscillating element (CR_2) provided in place of a combination of 2-terminal oscillating element (CR_1) and two externally provided capacitors (C_1 and C_2) in a Colpitts circuit, wherein the first external capacitor (C_1) is connected to the input side of an amplifier of said Colpitts circuit and the second external capacitor (C_2) is connected to the output side of said amplifier, said 3-terminal oscillating element (CR_2) having: a piezoelectric body (1) having first and second surfaces in face-to-face relation to each other, said piezoelectric body having a central section pre-polarized in one direction between said first and second surfaces and a perimeter section pre-polarized in the opposite direction to said one direction; a first electrode (2) provided on the first surface over said central section of the piezoelectric body; a second electrode (3) provided on the first surface, in a spaced relation to said first electrode (2) and over said perimeter section of the piezoelectric body (1); and a counter electrode (4) provided on said second surface covering both said first and second sections of said piezoelectric body, said 3-terminal oscillating element (CR_2) characterized in that:

the following equations are substantially satisfied:

$$\frac{C_2}{C_1} = \frac{1}{n} \cdot \frac{C_{02}}{C_{01}}$$

wherein C_{01} is an electrostatic capacitance between the first electrode (2) and the counter electrode (4), C_{02} is an electrostatic capacitance between the second electrode (3) and the counter electrode (4), and n is an transformation ratio of an ideal transformer; and

$$1 \leqq \frac{S_2}{S_1} \leqq 10$$

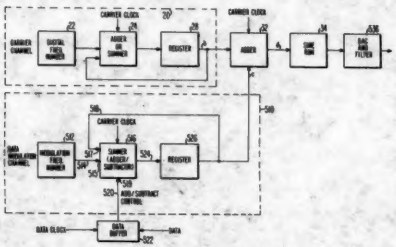
wherein S_1 and S_2 are areas of first and second electrodes, respectively.

4,628,286

DIGITAL FREQUENCY MODULATOR

Edward J. Nossen, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 17, 1985, Ser. No. 724,310
Int. Cl.[4] H03C *3/00*
U.S. Cl. 332—9 R **15 Claims**



1. A frequency modulator, comprising:

a source of digital sawtooth signal having a recurrence rate equal to the rest recurrence rate of the carrier to be frequency-modulated;

a source of digital information signal;

digital ramp signal generating means coupled to said source of digital information signal for generating a digital ramp signal having slope and polarity, at least said polarity being controlled in response to said digital information signal;

adding means coupled to said source of digital sawtooth signal and to said digital ramp signal generating means for adding together said digital sawtooth signal and said digital ramp signal for generating a frequency-modulated digital sawtooth signal; and

memory means including addressable memory locations, said memory means being coupled to said adding means for being addressed by said frequency-modulated digital sawtooth signal, each of said memory locations which is accessed being preprogrammed with a portion of a sinusoidal signal, whereby said memory means produces a frequency-modulated sinusoidal signal.

4,628,287

MULTIPORT RECTANGULAR TE_{10} TO CIRCULAR TE_{01} MODE TRANSDUCER HAVING PYRIMIDAL SHAPED TRANSDUCING MEANS

William H. Zinger, and Jerry A. Krill, both of Columbia, Md., assignors to The Johns Hopkins University, Baltimore, Md.

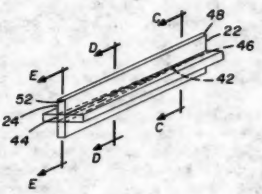
Filed Sep. 16, 1983, Ser. No. 532,892
Int. Cl.[4] H01P *1/16*
U.S. Cl. 333—137 **6 Claims**

1. A waveguide apparatus for transducing between a circular TE_{01} mode and multiple (n) rectangular TE_{10} modes comprising:

a first waveguide means having a circular cross section at one end thereof supporting said circular TE_{01} mode and a multiple (n) arm cross section at its opposite end forming a multiplicity (n) of radially extending waveguide arm segments, each supporting an intermediate TE mode,

a second waveguide means having a multiple (n) radially extending arm cross section along its length and being connected at one end to mate with said opposite end of said first waveguide means, the opposite end of said second waveguide means being formed as a multiplicity (n) of radially extending rectangular arms each open on one of its shorter sides facing the center of said second waveguide means,

a pyramidal means having an apex centered within said second waveguide means adjacent to but physically disconnected from said one end of said second waveguide means and having a base centered within said second waveguide means at the opposite end of said second waveguide means, said pyramidal means having a multiplicity (n) of sides extending the length of said second waveguide



means but disconnected physically from said second waveguide means except adjacent the base of said pyramidal means to close the open side of each of said multiplicity (n) of radially extending rectangular arms and complete formation of a multiplicity (n) of rectangular waveguide elements, each supporting said rectangular TE_{10} mode, and

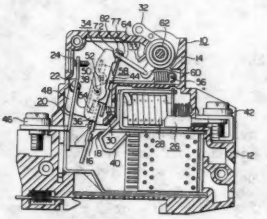
a third waveguide means comprising a multiplicity (n) of separate rectangular waveguide members each supporting said rectangular TE_{10} mode and each having one end connected to a respective one of the waveguide elements formed by the connection of said second waveguide means and the base of said pyramidal means.

4,628,288

CIRCUIT INTERRUPTER

Hiroaki Fujihisa; Hirotoshi Ohishi, both of Fukuyama; Hiroshi Fujii, Asaguchi County, and Yoshiaki Kobayashi, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1985, Ser. No. 721,895
Claims priority, application Japan, May 15, 1984, 59-99216; May 15, 1984, 59-99217
Int. Cl.[4] H01H *9/20*
U.S. Cl. 335—166 **6 Claims**



1. A circuit interrupter comprising:

a pair of separable contacts, at least one of which is movable;

an operating handle for manually operating said interrupter; and

an operating mechanism operatively connected to move the movable contact relative to the other contact for opening and closing said circuit interrupter;

said operating mechanism including:

a movable contact arm carrying the movable contact at one end and providing a latch surface at the other end;

a latch member pivotally mounted on said movable contact arm and having a latching end spaced from said latch surface to form a jaw therebetween;

a toggle link mechanism connected at one end to an operating handle and at the other end with said movable contact arm and said latch member, said toggle link mechanism including a first link connected to said operating handle and a second link pivotally connected to said first link at one end and having roller means rotatably mounted on the other end thereof, said mechanism having an extended position corresponding to an open contact position of said handle and a collapsed position corresponding to a closed contact position of said handle, said second link being adapted to be received and held in said jaws by engagement with said latching end and said latching surface to operate said movable contact arm to manually open and close said contacts by said interrupter upon movement of said handle between open and closed positions, said roller means being slidably released from said jaw by coaction with said latch surface upon movement of said latching end away from said latch surface caused by movement of said operating mechanism to the collapsed position to trip said interrupter; and

means on said movable contact arm providing a stop surface for preventing the movement of said other end of said toggle link mechanism beyond the point at which said toggle link mechanism is partly collapsed when said contacts are welded to each other.

4,628,289

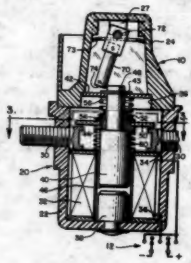
LATCHING RELAY

William B. Huber, Oak Park, Ill., assignor to Nuvatec, Inc., Downers Grove, Ill.

Filed Oct. 11, 1985, Ser. No. 786,612

Int. Cl.[4] H01H *9/20*

U.S. Cl. 335—168 **17 Claims**



1. A latching relay comprising:

a frame;

a switch mounted to the frame and including at least one movable contact movable between a first state and a second state, wherein the switch is open in one of the first and second states and closed in the other;

moving means for generating an electromagnetic field to electromagnetically move the contact to the first state;

means for biasing the contact to the second state;

a blocking member comprising a permanent magnet which generates a magnetic field, said blocking member movably mounted to the frame and movable between a blocking position, in which the blocking member holds the contact in the first state, and an unblocking position, in which the blocking member allows the biasing means to move the contact to the second state;

said electromagenetic field operative to interact with the magnet to electromagnetically shift the blocking member between the blocking position and the unblocking position;

said blocking member cooperating with the frame when the blocking member is in the blocking position to restrain movement of the contact to the second state with a force independent of the strength of the magnetic field.

4,628,290

ELECTROMAGNETIC RELAY WITH ZIG-ZAG ARMATURE SPRING

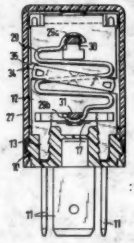
Joachim Naser, Nuremberg; Olaf Schmid, Schwabach; Gerhard Schmidt, Weihenzell; Theodor Sturm, Sachsen, and Berthold Walter, Oberasbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,572

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1984, 3423269

Int. Cl.[4] H01F *7/08*

U.S. Cl. 335—274 **6 Claims**



1. Electromagnetic relay comprising an inverted-L magnet yoke upstanding from a base of insulation material through which pass connection prongs fixed in said base, an electromagnet core extending from said yoke towards said base having a winding spool and a winding in said spool supported so as to encircle said core,

said yoke (12) having a bearing seat aligned substantially parallel to said base for an armature, near its attachment to said base;

a substantially flat armature of a configuration enabling it to swing in a space between said core and said base about said bearing seat on said yoke (12), having a portion extending in a first direction from said bearing seat towards the side of said relay remote from said armature bearing seat and a portion extending in a second direction substantially opposite to said first direction across and beyond said bearing seat;

a switch contact resiliently mounted on said armature so as to move in a path near said side of said relay remote from said armature bearing seat;

at least one fixed contact mounted for cooperation with said switch contact, and

a spring for returning said armature to its state of rest, in the form of a spring wire (29) bent into meander shape (28), connected at one end to said magnet yoke (12) and at the other end to said armature portion (31) extending in said second direction across said bearing seat.

4,628,291

FULL RANGE OIL EXPULSION FUSE

Wayne W. Lien, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

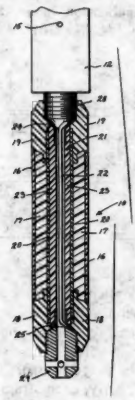
Filed May 22, 1985, Ser. No. 736,959

Int. Cl.[4] H01H *85/02*

U.S. Cl. 337—203 **18 Claims**

1. An under oil expulsion fuse, comprising a tubular assembly having an electrically conductive contact on each end, a fuse link supported within the assembly being electrically

connected to each of said contacts, and support for said fuse link which includes a resilient material with a bore opening to accept the fuse link, said tubular assembly includes an arc resistant surface layer, a high strength intermediate layer of



non-conducting material which secures the end contacts in place and contains the forces developed during fuse clearing, and an inner layer of reilient non-tracking, non-conducting material with the ability to absorb and contain particulate matter impacted upon it.

4,628,292

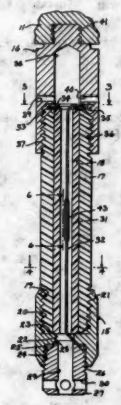
UNDER OIL EXPULSION FUSE CARTRIDGE ASSEMBLY

Frank J. Muench, Waukesha, and Gordon T. Borck, Cudahy, both of Wis., assignors to RTE Corporation, Waukesha, Wis.

Filed Jun. 24, 1985, Ser. No. 748,266

Int. Cl.[4] H01H *85/02, 85/14*

U.S. Cl. 337—204 **19 Claims**



1. An under-oil expulsion fuse cartridge assembly, comprising:

a tubular housing of non-electrical conductive material having a bore extending longitudinally therethrough;

an electrically conductive contact member mounted on each end of said housing;

a fuse liner tube removably receivable within the bore of said housing, and having an opening extending longitudinally therethrough;

a fuse link removably receivable within the opening of said fuse liner tube;

mounting means for mounting one end of said fuse link, said mounting means including spacer means engageable with one of said end contact members to prevent direct contact of said one end of said fuse link with said one end contact member; and

clamping means for clamping the other end of said fuse link in engagement with the other end contact member.

4,628,293

SUB-MINIATURE FUSE

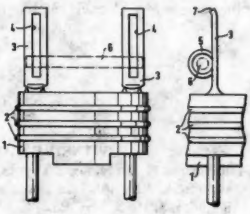
Werner Marx, Witten, Fed. Rep. of Germany, assignor to Wickmann Werke GmbH, Fed. Rep. of Germany

Filed Mar. 5, 1985, Ser. No. 708,532

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1984, 3408854

Int. Cl.[4] H01H *85/52, 85/62*

U.S. Cl. 337—216 **5 Claims**



1. Electric sub-miniature fuse of the type comprising at least

plastic base means defining an upper side and a lower side;

two electric conductor means passing through said base means to form upper and lower conductor extensions beyond said upper and said lower sides, respectively;

electric fuse wire means bridging said upper conductor extensions and having soldered connections therewith;

wherein each of said upper conductor extensions is formed with holder means for engagement with said fuse wire means, respectively, and defining the positions for said soldered connections at said upper conductor extensions, said holder means being formed by a deformation of each one of said upper conductor extensions, respective, said soldered connections being formed by soft solder melting material applied to said holder means and said fuse wire means for reinforcing said engagement of said fuse wire means by said holder means.

4,628,294

END CAP ASSEMBLY FOR A FLUID RESISTANT ELECTRICAL DEVICE

Delbert R. Parker, and Daren A. Clark, both of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Nov. 22, 1985, Ser. No. 800,718

Int. Cl.[4] H01H *85/14, 85/04*

U.S. Cl. 337—248 **17 Claims**

1. In an end cap assembly for a fluid resistant electrical device, the combination of:

an end cap engageable with an insulating tube and having solderable walls defining a tubular opening;

an insert having a solderable body portion positioned within said tubular opening of said end cap,

said walls defining said tubular opening being formed for complemental, mating contact with said body portion such that mechanical interference is provided to limit movement of said insert relative to said end cap during assembly,

said body portion having a peripheral groove adjacent said walls defining said opening, said walls being disposed to each side of said groove; and

a quantity of solder located within said groove and adhering to at least a portion of said walls and said body portion to preclude movement of said insert relative to said end cap.

4,628,295

TEMPERATURE RESPONSIVE SWITCH

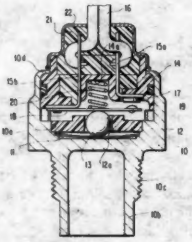
Keiji Yasuda, Handa, and Hideo Haneda, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed May 3, 1985, Ser. No. 730,148

Claims priority, application Japan, May 4, 1984, 59-065596[U]

Int. Cl.⁴ H01H *37/52*

U.S. Cl. 337—354 **1 Claim**



1. A temperature responsive switch comprising a switch body, a bimetallic disc disposed in said switch body and adapted to be snapped over center in response to changes in the surrounding temperature, a guide member disposed within said body adjacent said bimetal disc and having a hole extending therethrough, a spherical member moveably disposed within said hole of said guide member in contact with the center of said bimetal disc, an electrically conductive leaf spring fixed to said body at one end thereof and overlying said hole in engagement with said spherical member, an electrical contact secured to the other end of said leaf spring for movement therewith in response to movement of said spherical member, a stationary electrical contact fixed within said switch body for contact by said moveable electric contact upon movement thereof in response to changes in the configuration of said bimetal disc in response to temperature changes and biasing means disposed within said body for normally biasing said leaf spring in a direction towards the spherical member to separate said electrical contacts.

4,628,296

LOAD CELL

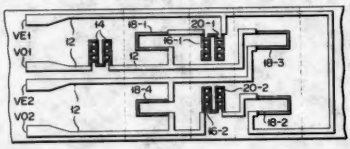
Tohru Kitagawa, and Koichiro Sakamoto, both of Mishima, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1984, Ser. No. 616,964

Claims priority, application Japan, Jun. 13, 1983, 58-105497

Int. Cl.⁴ G01L *1/22*

U.S. Cl. 338—3 **18 Claims**



1. A load cell comprising:

a beam body having at least one strain generating section with a substantially flat, straight-edged, multi-sided surface section;

a plurality of strain gauge resistors formed on and insulated from said beam body, each strain gauge having one portion closest to an associated edge of said surface;

a conductive pattern including a conductive layer formed along at least a portion of the periphery of said beam body and coupling said strain gauge resistors to form a bridge circuit, said conductive layer being interposed between said one portion of each of said strain gauge resistors and its associated surface edge;

each of said strain guage resistors having its said one portion spaced at a preset distance from the portion of the interposed conductive layer to which it is closest, said present distance for one strain gauge resistor being equal to the preset distance for at least another of said strain gauge resistors.

4,628,297

CODE MODULATION SYSTEM

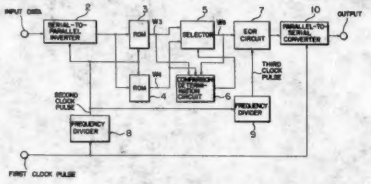
Seiichi Mita, Kanagawa; Morishi Izumita, Inagi; Masuo Umemoto, Tokyo; Yoshizumi Eto, Sagamihara; Morito Rokuda, Katsuta, and Hidehiro Kanada, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 30, 1985, Ser. No. 696,477

Claims priority, application Japan, Feb. 1, 1984, 59-15228

Int. Cl.⁴ H03K *13/24*; G11B *5/09*

U.S. Cl. 340—347 DD **6 Claims**



1. A code modulation apparatus for converting input data levels into an output signal in the form of code words, comprising:

a first ROM and a second ROM for respectively providing predetermined code weights in the form of code words, said code weights changing in level in accordance with changes in the input data level along a stairlike characteristic, a code weight provided by said first ROM for an input data level in the vicinity of a transition point in the changes in level of the stairlike characteristic being differ-

ent from that provided by said second ROM for the same input data level;

a selector for selecting either the output of said first ROM or the output of said second ROM and sending out the output thus selected;

a comparison determination circuit for receiving the output of said first ROM and the output of said second ROM and for sending a selection command to said selector in accordance with predetermined determination criteria, said selector selecting either the output of said first ROM or that of said second ROM as an output thereof on the basis of said selection command, in accordance with said predetermined determination criteria, the output of said first ROM being selected for changes in the increasing direction of said input data level and the output of said second ROM being selected for changes in the decreasing direction of said input data level; and

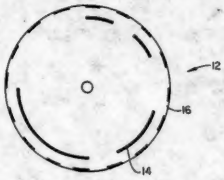
an exclusive-OR circuit for inverting the output of said selector for every other code word and sending out the inverted and non-inverted code words as said output signal.

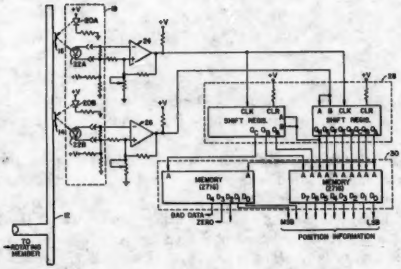
4,628,298

CHAIN CODE ENCODER

Ralph S. Hafle, Benton, and Mark D. Love, Littlerock, both of Ark., assignors to BEI Motion Systems Company, Inc., Santa Barbara, Calif.

Filed Jun. 22, 1984, Ser. No. 623,843
Int. Cl.[4] H03M *1/00*
U.S. Cl. 340—347 P **15 Claims**





1. An apparatus providing information of the position of a rotating member having an axis of rotation, comprising

code means positioned for rotation with the rotating member for providing a code sequence of code cycles arranged circumferentially about the axis of rotation of the rotating member, wherein each code cycle is associated with a unique position of the rotating member and provides position data, and further wherein the position data from each code cycle, in combination with the position data from adjacent N-1 consecutive code cycles, defines a pattern which is unique from the pattern formed by the position data from any other N consecutive code cycles in the code sequence, so that each N consecutive code cycles identify a unique position of the rotating member wherein the code sequence comprises a series of bits formed by the bits occupying a selected bit position in each of the words in a sequence of N-bit code words the sequence of N-bit code words being formed according to the steps of:

a. beginning with all N-bits of a first N-bit code word in a first logic state;

b. shifting the bits in the first N-bit code word by one bit position so that a bit position is vacated;

c. setting the vacated bit position to a second logic state, different from the first logic state, to form a new N-bit code word and assigning the new N-bit code word to the sequence of N-bit code words if the new N-bit code word does not match any of the other N-bit code words in the sequence of N-bit code words;

d. setting the vacated bit position to the first logic state to form an alternate N-bit code word and assigning the alternate N-bit code word to the sequence of N-bit code words if the new N-bit code word of step "c" matches any of the other N-bit code words in the sequence of N-bit code words; and

e. repeating steps "b" through "d" until 2^N N-bit code words are present in the sequence of N-bit code words, wherein in step "b" the "first N-bit code word" is replaced by the N-bit code word that was assigned to the sequence of N-bit code words in steps "c" and "d";

means for reading the code cycles of the code sequence which are brought into instantaneous registration with a monitoring point as the rotating member is rotated, wherein the monitoring point is fixed in position relative to the rotating member;

means coupled to the reading means for extracting the position data from the code cycles being read by the reading means and for temporarily storing the position data in the order received; and

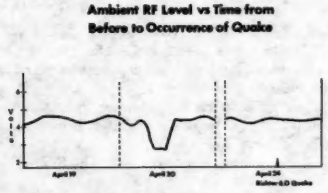
means coupled to the extracting and storing means for converting the consecutive sequence of the N most recently received position data into positional information.

4,628,299

SEISMIC WARNING SYSTEM USING RF ENERGY MONITOR

Joseph B. Tate, Sausalito, and David E. Brown, Mill Valley, both of Calif., assignors to David Pressman, San Francisco, Calif., a part interest

Filed Jan. 28, 1985, Ser. No. 695,632
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—540 **20 Claims**



1. A method for providing an early warning of the future occurrence of an earthquake, comprising the following steps:

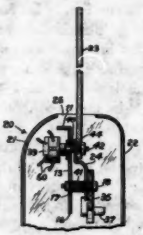
(a) measuring the field strength of at least one broadcast radio frequency signal at a location separated from the place of transmission of said signal, and

(b) providing a humanly-sensible indication if the strength of said signal decreases beyond a predetermined amount from a previous value thereof.

4,628,300
MOTOR VEHICLE LOCK COVER DEVICE

Louis Amato, 69 Winfield Ave., Staten Island, N.Y. 10305

Filed Jun. 3, 1985, Ser. No. 740,535
Int. Cl.[4] E05B 45/06, 17/00
U.S. Cl. 340—542 8 Claims



1. A motor vehicle lock cover protective device for a motor vehicle door having an outside door panel, a door lock with a plurality of levers controlling the locks, window glass and a window sash designed to hold the window glass, comprising:

(a) a cover strip of rigid material of predetermined length and width to substantially cover the space between the vehicle window glass and the outside panel of the vehicle door;

(b) a rigid support strip extending downwardly along the length of one edge of the cover strip at a right angle to the cover strip;

(c) a rigid mounting plate extending downwardly from the free edge of the support strip at a right angle to the cover strip, the plate having an upper base along the edge of the support strip, a lower base and two sides, the opposed ends of the strips extending beyond the ends of the upper base of the mounting plate; and

(d) means to fixedly secure the mounting plate to the window sash for movement therewith, the mounting plate being positioned at a predetermined distance along the length of the support strip and being of predetermined height from the lower base to the upper base whereby the mounting plate extends to the window sash for securing thereto and the cover strip is held in a position recessed below the window sill.

4,628,301
ELECTRICAL CIRCUIT ARRANGEMENTS

Alfred R. Brown, Stanwell, and Richard A. Whetton, Maidenhead, both of England, assignors to Graviner Limited, Buckinghamshire, England

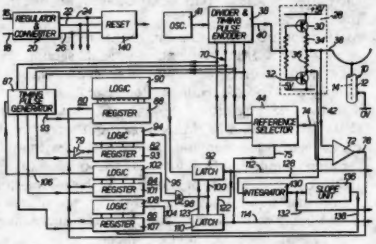
Filed Oct. 30, 1984, Ser. No. 666,399
Claims priority, application United Kingdom, Nov. 4, 1983, 8329473
Int. Cl.[4] G08B 17/06; G01K 7/00
U.S. Cl. 340—584 23 Claims

1. An electrical circuit arrangement, comprising

detecting means whose charge storage capability increases under predetermined conditions,

driving means connected to the detecting means to apply thereto a continuous alternately positive and negative test waveform, the driving means incorporating circuit means providing respectively different impedances for the positive and negative portions of the waveform, and

digital testing means responsive to the said waveform and operative at predetermined time instants during its positive and negative portions to compare its amplitude with predetermined reference thresholds whereby to determine

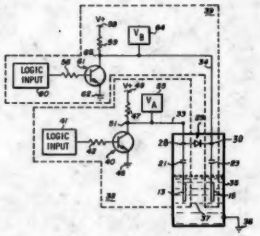


asymmetry of the waveform caused by an increase in the charge storage capabilities of the detecting means.

4,628,302
LIQUID LEVEL DETECTION SYSTEM

A. Brinkley Barr, Woodinville, and D. Craig Edwards, Bellevue, both of Wash., assignors to Baker International Corporation, Orange, Calif.

Filed Sep. 14, 1984, Ser. No. 651,047
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—620 21 Claims



1. A system for detecting the presence and absence of an electrically-conductive liquid at a particular level in a vessel comprising:

(a) first and second metallic probe members for mounting at a fixed location within the interior of a vessel containing electrically-conductive liquid;

(b) first and second capacitor means connected to the first and second probe members, respectively;

(c) first switch means to selectively couple the first capacitor means to ground, and second switch means to concomitantly couple a constant voltage source to the second capacitor means;

(d) comparator means connected to said second capacitor means to sense the magnitude of the electrical charge thereon at predetermined times following coupling of the second capacitor means to the voltage source, the sensed charge magnitude being indicative of the presence of electrically-conductive liquid surrounding the second probe member; and

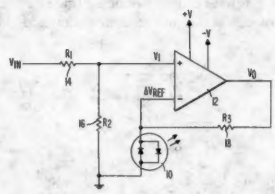
(e) indicator means coupled to the comparator means and responsive thereto to indicate the presence of electrically-conductive liquid at the level in the vessel at which the second probe member is mounted.

4,628,303

VISUAL MONITOR FOR ELECTRICAL SIGNALS

Richard C. Boyle, Springfield, Pa., assignor to System Development Corporation, McLean, Va.

Filed Jun. 5, 1985, Ser. No. 741,474
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—661 6 Claims



1. A circuit for monitoring the status of electrical signals comprising:

a circuit input terminal for receiving said electrical signals, a voltage divider network coupled between said input terminal and a source of reference potential,

an operational amplifier having a first and a second input terminal and an output terminal, means coupling said first input terminal of said amplifier to a predetermined point on said divider network,

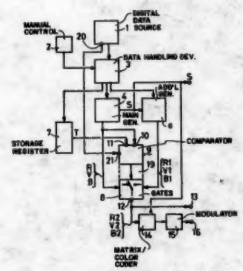
an LED indicator having a pair of terminals, means coupling the output terminal of said operational amplifier in common to said second input terminal of said amplifier and to one of said terminals of said LED indicator, the other of said terminals of said LED indicator being coupled to said source of reference potential.

4,628,304

SYSTEM FOR GENERATING TRICOLOR VIDEO SIGNALS, SUCH AS A GAME, AND A REMOVABLE CARTRIDGE INTENDED FOR SUCH A SYSTEM

Michel Bottiau, Maurepas, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,597
Claims priority, application France, Sep. 14, 1982, 82 15532
Int. Cl.[4] H04N 7/00
U.S. Cl. 340—703 6 Claims



1. A system for generating color video signals comprising:

a source for storing and supplying digital data;

a device for processing digital data coupled to an output of said source;

manual control means coupled to said processing device for the control thereof; and

a generator coupled to a first output of said processing device for generating color signals R, V, B in the form of a range of quantized values, and field and line synchronizing signals, these signals forming on a screen a picture from the digital data supplied by said source; wherein said system further comprises:

an additional generator coupled to a second output of said processing device for generating color signals R_1, V_1, B_1, for forming on said screen an additional picture, said addition generator also being coupled to said generator for receiving said field and line synchronizing signals so that said additional picture is synchronous with the picture formed on said screen by said generator;

a storage register coupled to a third output of said processing device for storing at least one predetermined color code corresponding to a combination of values in said range of values of the color signals R, V, B;

a selection device coupled to an output of said generator and an output of said additional generator, said selection device including a set of selection gates for selectively applying the signals R, V, B and R_1, V_1, B_1, respectively, to an output thereof; and

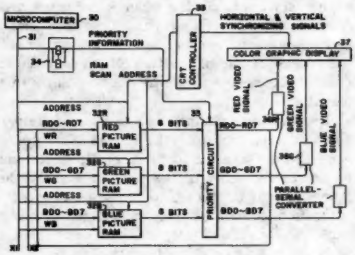
a comparator having a first input comprising a decoder to which the signals R, V, B are applied, a second input coupled to an output of said storage register, and an output coupled to a control input of said set of selection gates, whereby said selection gates apply the signals R_1, V_1, B_1 generated by the additional generator to the output thereof instead of the signals R, V, B generated by said generator, each time said predetermined color code supplied by said storage register and the signals R, V, B generated by said generator and decoded by said decoder are identical.

4,628,305

COLOR DISPLAY UNIT

Yoshiaki Ikeda, Hachioji, Japan, assignor to Fanuc Ltd, Hino, Japan

Filed Sep. 29, 1983, Ser. No. 536,877
Claims priority, application Japan, Sep. 29, 1982, 57-172459
Int. Cl.[4] G09G 1/00, 1/28
U.S. Cl. 340—703 12 Claims



1. A color display unit comprising:

a plurality of picture RAMS, each having memory locations corresponding to display points of a display, and each said picture RAM corresponding to a predetermined color;

write means for writing respective graphic form information into the plurality of picutre RAMs;

priority specifying means for setting therein respective predetermined priority levels of the outputs of the plurality of picture RAMs;

a CRT controller for accessing the plurality of picture RAMs in synchronism with one another;

a priority circuit for respectively outputting in accordance with the priority levels specified by the priority specifying means, the outputs of the plurality of picture RAMs accessed by the CRT controller; and

a color dispaly means for providing said display with said display points, said color display means being supplied with the output of the priority circuits, for displaying graphic forms determined by the combination of the

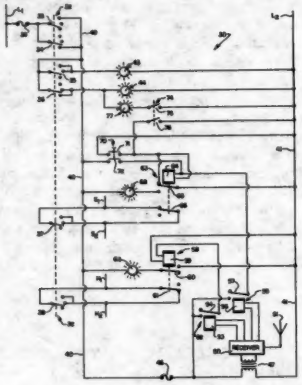
graphic form information in said plurality of picture RAMs and said priority levels, in colors also determined by said combination.

4,628,306

REMOTE CONTROL SYSTEM FOR AUTOMATED EQUIPMENT

Robert H. Root, Vermilion, Ohio, assignor to South Coast Research, Inc., Vermilion, Ohio

Filed Sep. 6, 1983, Ser. No. 529,218
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.00 **11 Claims**



1. A control unit for automated equipment having hard stop and soft stop controls comprising:

an RF receiver capable of receiving two different RF signals from a transmitter;

a momentary contact relay means comprising a first relay operator and first relay contacts, the first relay operator connected to the receiver to be energized in response to the receipt of one of the two RF signals, the first relay contacts connected to the hard stop control of the automated equipment;

a latch relay means comprising a second relay operator and a second relay contacts, the second relay operator connected to the receiver to be energized in response to the receipt of the other of the two RF signals, the second relay contacts connected to the soft stop control of the automated equipment, the second relay operator connected to the second relay contacts to disable the second relay operator after it has been energized;

reset switch means connected to the second relay operator to energize the second relay operator independently of the receiver; and

override switch means connected to the second relay operator to permit the second relay operator to be reenergized in response to the receipt of said other of the two RF signals.

4,628,307

FET SWITCH FOR HIGH FREQUENCY SIGNALS

William G. Crouse, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 18, 1984, Ser. No. 683,104
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 340—825.05 **27 Claims**

1. An improved circuit arrangement comprising:

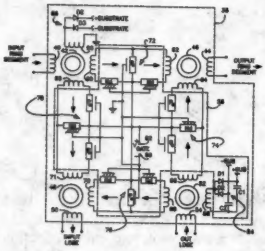
a control means operable for providing an enabling signal; and

a switching means being responsive to said enabling signal; said switching means comprising a first FET device having a gate electrode, a source electrode and a drain electrode;

a second FET device having a gate electrode, a source electrode and a drain electrode; and

a third FET device having a gate electrode, a source electrode and a drain electrode;

wherein the source electrodes of the FET devices are connected to a first common node so that the first and second FET devices are connected in series and the third FET



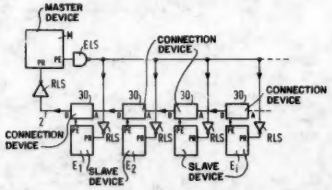
device is connected in parallel with the serially connected pair and the gate electrodes of the FET devices are connected to a second common node, whereby said first and said second FET devices are made to conduct and the third FET device is made not to conduct when the enabling signal of a first polarity is applied to the first and the second common nodes and said first and said second FET devices are made not to conduct and said third FET device is made to conduct when the enabling signal of a different polarity is applied to the common nodes.

4,628,308

COMMUNICATION NETWORK HAVING A MASTER-SLAVE TYPE SERIES ARCHITECTURE AND PROVIDING MASTER-TO-SLAVE AND SLAVE-TO-MASTER COMMUNICATION

Serge Robert, Jouy en Josas, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 11, 1984, Ser. No. 680,453
Claims priority, application France, Dec. 21, 1983, 83 20481
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 340—825.43 **4 Claims**



1. A communication network having a series architecture and comprising an electronic master device and a plurality (N) of electronic slave devices, each electronic slave device being provided with an associated connection device having a first input connected to a transmitting port of the relevant electronic slave device and an output, each connection device which is associated with a slave device other than the first in the series has a second input, the second input of the connection device associated with a j-th ($2 \leqq j \leqq N$) electronic slave device being connected via a communication channel to the output of the connection device associated with the (j—1)-th electronic slave device in the series, the output of the connec-

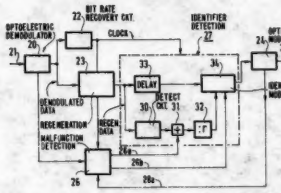
tion device associated with the N-th electronic slave device being connected to a line input of a first dedicated line receiver having a line output connected to a receiving port of the electronic master device, said first dedicated line receiver effecting a voltage-level conversion in order to derive a relatively small voltage-level swing from a relatively large voltage-level swing applied to its line input and applying said relatively small voltage-level swing to its line output, each of said connection devices comprises voltage level conversion means connected between said first input and said output, said voltage level conversion means effecting a voltage level conversion from said supplied relatively small voltage-level swing to said relatively large voltage-level swing and applying said relatively large voltage-level swing to said output, each of said connection devices having a second input comprising a second dedicated line receiver for carrying out a voltage level conversion from said relatively large voltage-level swing applied on said second input to said relatively small voltage-level swing and for applying said relatively small voltage-level swing to an input of the voltage level conversion means of the corresponding connection device.

4,628,309

SYSTEM AND DEVICE FOR REMOTE SURVEILLANCE OF EQUIPMENT ON A DIGITAL TRANSMISSION LINK WITHOUT INTERRUPTING TRAFFIC

Bernard Allias, Bretigny sur Orge, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Dec. 6, 1983, Ser. No. 558,672
Claims priority, application France, Dec. 6, 1982, 82 20406
Int. Cl.[4] H04Q *9/00*; H04B *17/02*; G06F *11/00*
U.S. Cl. 340—825.54 **5 Claims**



1. A system for remote surveillance of equipment on a digital transmission link connecting a transmitter terminal to a receiver terminal without interrupting traffic, said link transmitting an on-line signal using a redundant code having at least one prohibited configuration, said system comprising:

first means at the transmitter terminal for periodically introducing into the on-line signal an interrogation identifier containing said prohibited configuration;

second means for recognizing interrogation identifiers as they pass through each equipment unit;

third means for changing one interrogation identifier out of r recognized interrogation identifiers to encode remote surveillance data in equipment having remote surveillance data to be transmitted, r being an integer greater than one;

fourth means at said receiver terminal for receiving unchanged interrogation identifiers and responsive to said unchanged interrogation identifiers for determining periodic time slots occupied in said on-line signal by interrogation identifiers changed or unchanged;

fifth means responsive to said fourth for separating said interrogation identifiers from said on-line signal at said receiver terminal; and

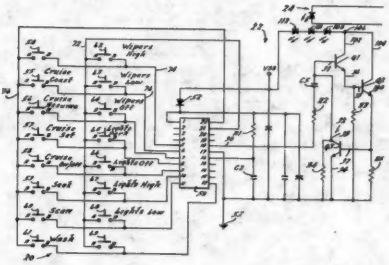
sixth means for decoding said interrogation identifiers to provide said remote surveillance data.

4,628,310

MULTIFUNCTION STEERING WHEEL

Robert P. Reighard, Holland; Wilbur L. McCoy, Toledo, and William P. Gobeille, Sylvania, all of Ohio, assignors to Sheller-Globe Corporation, Toledo, Ohio

Continuation of Ser. No. 475,891, Mar. 16, 1983, abandoned.
This application Nov. 1, 1985, Ser. No. 794,953
Int. Cl.[4] G08C *23/00*
U.S. Cl. 340—825.72 **1 Claim**



1. A multifunction steering wheel for controlling the operation of devices disposed on a vehicle having a steering column comprising:

steering wheel member rotatably carried on said steering column and having a hollow spokelike arm;

manually actuable hermetically sealed keypad disposed on said steering wheel member, said keypad comprising a plurality of individual switches connected in a matrix configuration;

a transmitter module disposed within said arm and coupled to said switches, said transmitter module having encoder means for providing strobe signals to said switching and having an input bus coupled to said switches for interrogating said switches, said encoder means further having an output means for providing predetermined encoded output pulses in response to activation of said switches;

said transmitter module having transistor driver circuit comprising a first transistor having the base thereof coupled to said output means of said encoder and comprising a second transistor having the base thereof coupled to the emitter of said first transistor and said first and second transistors having their respective collectors coupled together to provide an output node;

said transmitter module further having a current limiting circuit comprising load resistor coupled between the emitter of said second transistor and ground and comprising a third transistor having the base thereof coupled to said load resistor and having the emitter thereof coupled to ground and having the collector thereof coupled to the base of said first transistor and further having second resistor coupled between the collector of said third transistor and ground;

said current limiting circuit being operable to sense the collector current of said first transistor and to turn off said first transistor to prevent excessive current flow;

a plurality of mutually connected light emitting diodes coupled to said output node of said driver circuit for producing light impulses in accordance with said output pulses, said light emitting diodes being equally spaced about a circular locus and positioned to direct illumination toward said steering column;

a receiver module positioned within said steering column, said receiver module including a phototransistor mounted to receive illumination from said light emitting diodes, and further including amplifier circuit capacitively coupled to said phototransistor for providing amplified signals in accordance with said output pulses;

a decoder module positioned within said steering column and receptive of said amplified signals, said decoder module providing a plurality of input/output ports for providing a binary signals indicative of said encoded output pulses, said decoder module further including binary to decimal decoder means for receiving said binary signals and providing a plurality of individual output terminals, each terminal corresponding to a different one of said devices disposed on a vehicle; and

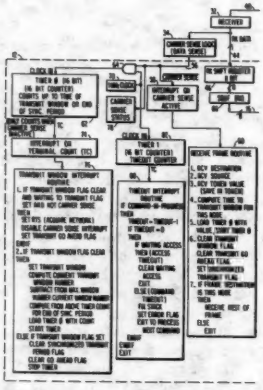
at least one flip flop means coupled to said output terminals for controlling at least one of said devices.

4,628,311

CARRIER SENSE MULTIPLE ACCESS WITH COLLISION AVOIDANCE UTILIZING ROTATING TIME STAGGERED ACCESS WINDOWS

Philip E. Milling, Delray Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1983, Ser. No. 543,632
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 340—825.5 **9 Claims**
MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 95 Pages)



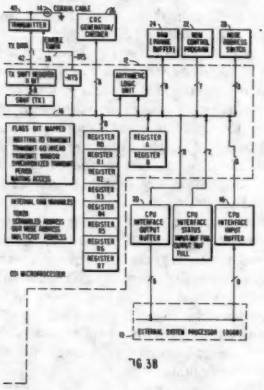


FIG 3B

1. In a communications system wherein a plurality of stations each transmit at different times to one another over a shared communications medium, each said station including detection means for detecting the presence or absence of a transmission on said communications medium, a method of controlling access by each station to said communications medium, said method comprising the steps of:

reserving an arbitration period of time commencing from the termination of each transmission on said medium,;

dividing said arbitration period into a plurality of access windows;

assigning unique arbitration addresses to stations sharing said medium;

generating, at each station desiring access to said medium, an access control number independent of the address of said each station to be transmitted to said medium as part of its communication;

receiving said access control number at each other station desiring access to said medium and combining said received access control number with the respective assigned address of said each other station to determine one of said plurality of access windows assigned to said each other station during the next arbitration period;

detecting at each station the termination of a transmission transmitted over said medium;

generating at each station a new access control number calculated from the current access control number; and

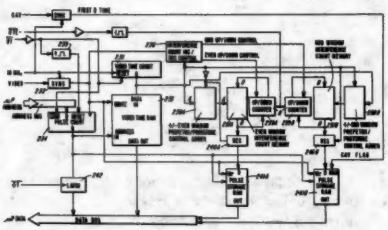
transmitting said new access control number from any station desiring access to said medium, during its respective access window if no other station has transmitted during a previous access window in the same arbitration period.

4,628,312

DECODING APPARATUS AND METHOD FOR A POSITION CODED PULSE COMMUNICATION SYSTEM

James G. Hwang; Robert F. Fleming, III, and Robert G. Hayworth, all of Vienna, Va., assignors to Vega Precision Laboratories, Inc., Vienna, Va.

Filed Oct. 19, 1983, Ser. No. 543,405
Int. Cl.[4] H04Q *7/00*
U.S. Cl. 340—825.640 **37 Claims**



1. A decoder for extracting data encoded in a plurality of position-coded pulse trains occurring at a substantially constant pulse format repetition frequency (PFRF), each of the pulse trains having a predetermined format including at least a first pair of pulses spaced from each other at a first interpulse interval representing predetermined address information, and a second pair of pulses spaced from each other at a second interpulse interval representing data, said decoder comprising:

recognition means for providing a verification signal upon each receipt of said pulse train having the predetermined format;

synchronization means responsive to the verification signals for calculating the PFRF of each of the pulse trains having the predetermined format and for providing an enabling signal window during a period representing the predicted occurrence of the next one of the pulse trains;

pulse storage means responsive to the enabling signal window for determining and storing an arrival time for each pulse arriving during said period; and

decoder processor means for determining the data by calcu-

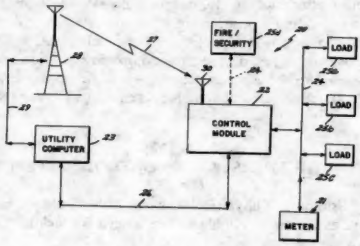
lating from the stored arrival times the second interpulse interval.

4,628,313

APPARATUS AND METHOD FOR REMOTELY MONITORING A UTILITY METER BY USE OF A LIQUID CRYSTAL DISPLAY

Peter P. Gombrich, Minneapolis; Steven K. Case, St. Louis Park, and Lawrence R. Konicek, Richfield, all of Minn., assignors to TeleMeter Corporation, Minneapolis, Minn.

Filed Sep. 12, 1984, Ser. No. 649,912
Int. Cl.[4] G08C 17/00
U.S. Cl. 340—870.02 9 Claims



1. An apparatus for optically sensing the angular position of a pointer member fixedly mounted on a rotatable shaft for rotational movement therewith as the shaft rotates about an axis of rotation, said apparatus comprising:

(a) a follower member fixedly interconnected into the rotatable shaft for rotation about the axis of rotation with the pointer member, said follower member and said pointer having a circumferential path of travel, said follower member having first and second opposite sides facing in opposite axial directions, a first portion of said first side being generally reflective for reflecting light in a forward direction and a second portion being generally absorptive;

(b) light emitting means positioned forward of said following member for emitting light in a backward direction towards said first side of said follower member;

(c) light detecting means positioned forward of said follower member for detecting light reflected off of said follower member in a forward direction;

(d) liquid crystal display means positioned forward of said follower member, between said follower member and said light detecting means, said liquid crystal display means defining six distinct areas disposed about the circumferential path of the follower member and a background area encompassing the remaining area of said liquid crystal shutter means;

(e) control means for switching said six distinct areas and said background area between an opaque state and a transparent state, said control means further providing for switching all of said distinct areas and said background area to the opaque state and then selectively switching each of said distinct areas, one at a time, to the transparent state while the remaining five areas and the background area are switched to the opaque state; and

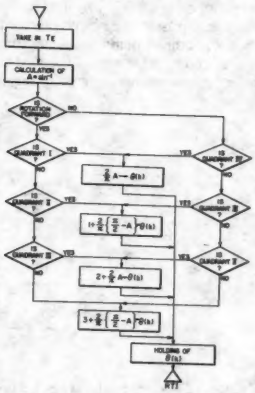
(f) means operatively interconnected to said light detection means for monitoring said light detection means and obtaining input signals therefrom so as to obtain a read-out of the angular position of the pointer member.

4,628,314

METHOD AND APPARATUS FOR DETECTING POSITION AND VELOCITY OF MOVING BODY

Shigeki Morinaga, Hitachi; Yasuyuki Sugiura, Takahagi; Kunio Miyashita, and Tadashi Takahashi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 668,893
Claims priority, application Japan, Nov. 8, 1983, 58-208221
Int. Cl.[4] G08C 19/16; G01P 3/52, 13/00
U.S. Cl. 340—870.24 5 Claims



1. A method for detecting position and velocity of a moving body by using a two-phase encoder mounted directly on said moving body, said encoder generating two sinusoidally varying original signals differing in phase, the method comprising the steps of:

pulse-width modulating one of said original signals by using a sampling carrier wave so as to derive a pulse-width modulated signal;

measuring a pulse width of said pulse-width modulated signal;

calculating, on the basis of said pulse width of said pulse-width modulated signal and a sampling time length of said sampling carrier wave, an angular position relative to a reference point of said moving body;

deriving, on the basis of said two original signals, information indicative of a quadrant of said one original signal in which said moving body is located;

deriving, on the basis of said angular position and said quadrant, the position of said moving body; and

deriving, on the basis of variations in said position, the velocity of said moving body.

4,628,315

ADDRESSABLE TRANSDUCER WITH IMPROVED ADDRESS SIGNAL PROCESSING

Norman F. Douglas, Albuquerque, N. Mex., assignor to Sparton Corporation, Jackson, Mich.

Filed Aug. 16, 1983, Ser. No. 523,693
Int. Cl.[4] G08C 19/16, 19/04
U.S. Cl. 340—870.26 4 Claims

1. An addressable transducer for use in a monitoring system of the type including a central station and multiple addressable transducers for monitoring the values of selected physical conditions at multiple locations with one of said transducers at each of said multiple locations,

said system being characterized by a single pair of transmission lines extending from the central station to all of said multiple locations and having a voltage thereon which is modulated at controlled intervals to produce successive binary address signals each including a train of pulses

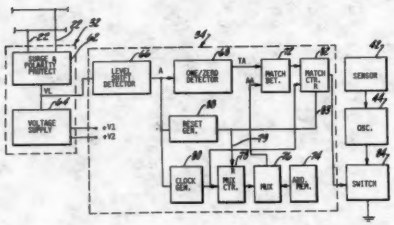
representing the binary bits of a transmitted address signal for selectively addressing one of the multiple transducers to obtain a data signal therefrom,

said transducer comprising:

a current sink oscillator having a frequency determining circuit for determining the oscillator frequency and being adapted to oscillate in response to application of an operating voltage,

a sensor including a condition responsive impedance element coupled with said frequency determining circuit and adapted to modify said oscillation frequency according to variations in value of said physical condition,

an address signal processing circuit coupled with said pair of lines and including memory means for storing multiple bits of a stored address signal assigned to the transducer, generating means including a clocking means responsive



to the pulses of said transmitted address signal for generating a train of pulses representing the binary bits of said stored address signal in bit-by-bit synchronism with the train of pulses of said transmitted address signal, a match detector for comparing said trains of pulses bit-by-bit, and a match counter for producing a control signal in response to a match of all bits of the transmitted address signal with all bits of the stored address signal,

and switching means responsive to said control signal for operatively coupling said oscillator to said pair of lines for deriving an operating voltage therefrom,

whereby said oscillator draws current from said pair of lines, said current having an undulating amplitude at the frequency of the oscillator whereby the frequency of the undulating current in said lines at said central station corresponds to the value of said physical condition.

4,628,316

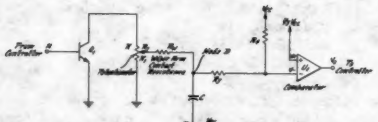
TEMPERATURE COMPENSATION CIRCUIT AND METHOD FOR POSITION SENSORS

Salim A. Momin, Troy, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Mar. 2, 1984, Ser. No. 585,804

Int. Cl.[4] G08C *15/00, 15/06*

U.S. Cl. 340—870.38 **4 Claims**



1. In a position sensing device to sense the position of a movable portion of a mechanism, the position sensing device with a controller to store data from and to present control signals to a temperature compensation circuit comprising:

a variable resistor with two end leads and a wiper arm;

a switching device connected across the two end leads of the variable resistor with the ability to short the two end leads upon command from a control signal from the controller to the device;

the wiper arm of the variable resistance device being mechanically connected to the movable portion of the mechanism;

a comparator with inverting and non-inverting inputs;

a voltage supply means, a fraction of which is connected to the non-inverting input to the comparator as a reference voltage;

a resistor connected between the wiper arm of the variable resistor and the inverting input to the comparator;

a capacitor with one lead connected to the wiper arm of the variable resistor and the other lead available for a step function control signal from the controller;

the comparator, changing output states when the voltage at its inverting input exceeds or drops below the reference voltage at the non-inverting input in response to the changing voltage on the capacitor as signaled by the controller;

the controller, storing the output curve of the comparator and providing a position signal representative of the position of the movable portion of the mechanism;

the position signal derived by comparing portions of the comparator's output curve generated in response to the step function control signals presented to the capacitor.

4,628,317

INTER-VEHICLE DISTANCE CONTROL SYSTEM FOR VEHICLES

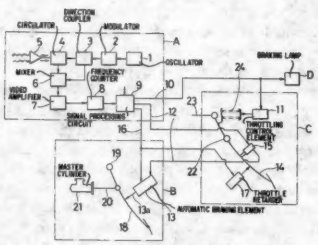
Masao Nishikawa, Tokyo, and Takashi Aoki, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1981, Ser. No. 288,033

Claims priority, application Japan, Aug. 4, 1980, 55-106949

Int. Cl.[4] G08G *1/16;* **B60Q** *1/44;* **B60T** *7/12;* **G01S** *13/93*

U.S. Cl. 340—903 **11 Claims**



1. An inter-vehicle distance control system for a vehicle having brake means and throttle means, comprising:

a control signal generating means for providing a control signal output indicative of a possibility of collision with an object ahead of the vehicle;

throttle control means for imparting to a throttle pedal a reaction force according to the intensity of said control signal output;

said reaction force being imparted in the direction of urging said throttle pedal to the engine-idling position thereof;

brake control means for operating in conjunction with said throttle control means in response to said control signal output to brake the vehicle automatically if a possibility of collision increases in the throttle control means activated condition;

said control signal output including a first signal provided when the distance between said vehicle and said object drops below a predetermined maximum reference value;

said first signal being fed directly to said throttle control means to operate said throttle control means;

said throttle control means including an assembly for pro-

ducing said reaction force according to the intensity of said first signal;

said control signal output includes a second signal provided when the distance between said vehicle and said object drops below a predetermined minimum reference value; and

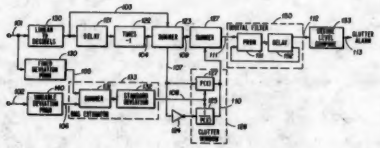
said second signal serving to operate said brake control means to brake said vehicle regardless of the operative condition of said throttle pedal.

4,628,318

GROUND CLUTTER SUPPRESSION TECHNIQUE

Orville J. Alitz, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 2, 1983, Ser. No. 557,679
Int. Cl.⁴ G01S *13/95*
U.S. Cl. 342—26 **17 Claims**



1. In a pulsed Doppler radar, a ground clutter identification circuit comprising:

a bifurcated parallel return signal processing circuit, one branch having a signal delay capability and both branches having linear-to-logarithmic conversion capability and respective outputs;

a deviation generator circuit for generating at least one deviation input functionally related to apparatus limitations for each signal received; and

means for summing said outputs of said processing circuit, coupled to both branches and to said deviation generator circuit.

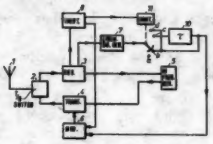
4,628,319

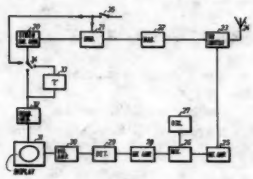
NAVIGATION SYSTEM

Bo A. Morwing, Åsa Stn; Bengt L. Andersson, Lindome, and Per-Olof G. Gustavsson, Mölnlycke, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE82/00364, § 371 Date Jun. 16, 1983, § 102(e) Date Jun. 16, 1983, PCT Pub. No. WO83/01838, PCT Pub. Date May 26, 1983
PCT Filed Nov. 2, 1982, Ser. No. 514,827
Claims priority, application Sweden, Nov. 16, 1981, 8106798
Int. Cl.⁴ G01S *13/80, 13/74*
U.S. Cl. 342—46 **9 Claims**

1. A navigation system comprising at least one pulse radar means for transmitting interrogating radar pulses of determinable repetition period and including a display means for making a display of echo signals which may include reflected signals, and at least one transponder means for receiving radar pulses and for transmitting in response to said pulses high frequency pulse modulated response signals, the transponder means including delay means and means associated with delay means for transmitting, on receiving an interrogating signal from the pulse radar means, response signals with a delay such that response signals from the said transponder means are displayed on the display with displacement relative to the position that the response signals would be displayed without said delay, said radar means including means for generating a scan on said display means and delay means for delaying the start of the scan by the same value as the delay of the response signal whereby the echo signals which are received from objects within a predetermined range of said pulse radar means are received before the start of the scan and thus are not shown whereas response signals from the transponder are displayed in the display, both said delay means providing respective delays of equal value and of such substantial fraction of the repetition





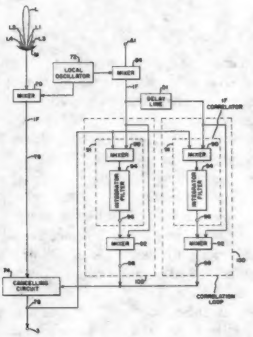
period as to eliminate all but the strongest echo signals received after the start of the scan.

4,628,320

CANCELLATION OF SCATTER JAMMING

John W. Downie, Dewitt, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Apr. 29, 1964, Ser. No. 363,645
Int. Cl.⁴ G01S *3/16, 3/28, 7/36*
U.S. Cl. 342—16 **6 Claims**



1. A signal processor for receiving desired signals and undesired signals and for cancelling the undesired signals comprising:

a main signal transmitting channel capable of imparting high gain to desired signals and relatively low gain to most undesired signals,

a subtracting circuit connected in said main signal transmitting channel between its input and output;

two auxiliary signal transmitting channels capable of imparting low gain to said desired signals and to said undesired signals,

a delay line connected in series with one of said auxiliary channels to provide a delay to desired and undesired

signals in said channel such as to bring said undesired signals into time synchronization with undesired signals in said main signal transmitting channel,

means including a separate correlator connected between the output of said main channel and each of said auxiliary channels to correlate said desired and undesired signals and to generate error signals adjusted in phase and in amplitude to correspond to the undesired signals in said main channel, and

means for applying said error signals to said subtracting circuit to reduce the magnitude of said undesired signals at the output of said main channel.

4,628,321

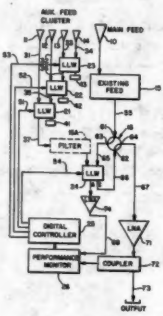
APERTURE TRANSFORMATION SIDELOBE CANCELLER

Gayle P. Martin, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 368,458, Apr. 14, 1982. This application Apr. 14, 1983, Ser. No. 484,844

Int. Cl.[4] H01J *29/52*

U.S. Cl. 342—379 **49 Claims**



1. For use in antenna system having a principal feed element and a reflector arrangement for directing energy to said principal feed-element, an auxiliary system for controlling the response pattern of said system comprising:

a plurality of auxiliary feed elements, disposed adjacent to said principal feed element;

first means, coupled to the signal output paths from said auxiliary feed elements, for selectively weighting and combining the outputs of said auxiliary feed elements;

second means, coupled to said first means and to said principal feed element, for selective combining and weighting the output of said first means and the output of said principal feed element; and

third means, coupled to said first and second means, for monitoring the output of said second means and controlling the selective weighting and combining action of said first means in response thereto.

4,628,322

LOW PROFILE ANTENNA ON NON-CONDUCTIVE SUBSTRATE

Paul D. Marko, Pembroke Pines; Thomas F. Kneisel, Davie, and Oscar M. Garay, N. Lauderdale, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 596,747, Apr. 4, 1984, Pat. No. 4,684,585. This application Mar. 17, 1986, Ser. No. 840,109

Int. Cl.[4] H01Q *1/24, 1/48*

U.S. Cl. 343—702 **4 Claims**

1. A low profile antenna, comprising:

a non-conductive substrate having a first side and a second side;

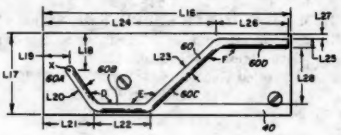
a first metallization pattern connected to said first side of said substrate and forming a passive element;

a second metallization pattern, connected to said second side of said substrate and forming an active element;

a ground plate in spaced parallel relation to said substrate; and

conductor means, for directly electrically connecting said passive element to said ground plate,

said driver element having a first mid-portion, a first end portion extending angularly inward from said first mid-



portion to a point constituting the antenna feed point, a second mid-portion extending angularly from said first mid-portion and a second end portion extending from said second mid-portion and overlapping the parasitic element,

said antenna having a low impedance coupling between said feedpoint and said passive element ground plate connection and a high impedance coupling between said second end of said driven element and said passive element, attributable to both the amount of overlap of said elements and the thickness of said substrate.

4,628,323

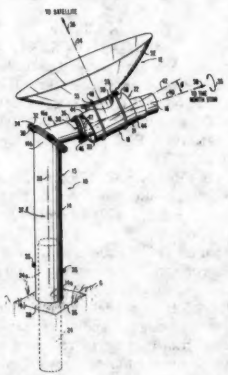
SIMPLIFIED POLAR MOUNT FOR SATELLITE TRACKING ANTENNA

Robert F. Crean, P.O. Box 1431, White River Junction, Vt. 05091

Filed Nov. 1, 1983, Ser. No. 547,613

Int. Cl.[4] H01Q *3/08*

U.S. Cl. 343—765 **13 Claims**



1. A polar mount apparatus for aligning a microwave directional antenna axis at a given site on the earth with a given satellite or a series of satellite within the earth's equatorial geosynchronous orbit track sector defining an equitorial plane, said apparatus comprising:

a directional antenna,

a cylindrical base member mounted for rotation about a vertical axis on the earth site and being cut at a diagonal at its upper end;

a cylindrical latitude adjustment member cut at one end at a diagonal, matching that of said base member,

means for rotatably mounting the cut ends of said members, end-to-end and for fixing said members after rotation such that said members rotate in the plane of the cuts tending between axial in line and right angle postions,

means for mounting said antenna to said latitude adjustment member for rotation about the axis of the latitude adjustment member and for fixing said antenna after rotation, and

said antenna mounting means comprises a declination angle adjustment head assembly carried by said cylindrical latitude adjustment member comprising means for adjusting the inclination of the axis of the antenna relative to the axis of the latitude adjustment member and for fixing the antenna axis at that inclination to a degree of declination necessary to compensate for the location of said polar mount apparatus on said earth site from said equatorial plane;

whereby, aligning is achieved by a series of steps comprising; rotating said latitude adjustment member on said base member to a position corresponding to the earth's latitude location and locking of said members together, rotating said cylindrical base member to align the axis of said latitude adjustment member to a position where said latitude adjustment member points to the north star and fixing it thereat, adjusting the position of the antenna on said latitude adjustment member to compensate for the declination angle relative to said equatorial plane at that latitude, and rotating said antenna about the axis of the latitude adjustment member until the directive antenna points to said given satellite within said sector.

4,628,324

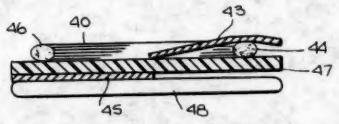
COIL ASSEMBLY FOR SUBSTANTIALLY ISOTROPIC FLUX LINKAGE IN A GIVEN PLANE

Thomas A. O. Gross, Lincoln, Mass.; Raymond L. Barrett, Jr., Oakland Park, and Henry F. Pfister, Wilton Manors, both of Fla., assignors to Sensormatic Electronics Corporation, Boca Raton, Fla.

Continuation of Ser. No. 368,370, Apr. 14, 1982, Pat. No. 4,549,186. This application Oct. 1, 1985, Ser. No. 782,738

Int. Cl.⁴ H01Q *7/00*

U.S. Cl. 343—788 **9 Claims**



1. A coil assembly for us in an article surveillance system in which coupling between said assembly and another component is to be established by linking said assembly and said component with an alternating magnetic field, said assembly comprising a coil in the form of a loop of flat configuration formed with electrically conductive turns encircling a first axis that is normal to the general plane of said coil, and means including magnetically permeable material in strip form throughout and extending inwardly across the interior of said coil from a first location beyond the perimeter of said coil inwardly through said coil interior to a second location also beyond the perimeter of said coil for providing a continuous low reluctant path through said coil which diverts flux of said field parallel to said general plane of said coil through said coil, such magnetically permeable material being movable in unison with said coil and having negligible effect upon linkage of said coil with flux in a direction normal to said general plane of said coil.

4,628,325

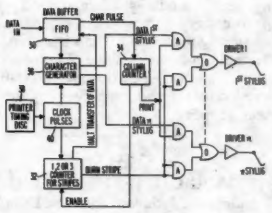
ELECTROMAGNETIC INTERFERENCE SUPPRESION FOR ELECTRICAL DISCHARGE PRINTERS

Flavius A. Mathamel, Dearborn Heights, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 27, 1984, Ser. No. 583,634

Int. Cl.⁴ G01D *15/08;* **B32B** *3/00*

U.S. Cl. 346—1.1 **35 Claims**



1. A method of operating an electrical discharge type printer in order to reduce the level of radiated electromagnetic emissions, said method comprising the steps of:

a. printing a number of sequences of images between the longitudinal edges of a length of electrosensitive paper; and

b. after printing said number of sequences, printing an isolation band extending across the entire width of said length of electrosensitive paper.

4,628,326

APPARATUS FOR PREVENTING DRYING-UP OF DRAWING NEEDLE PENS

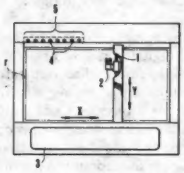
Sadaaki Fukumura, Tokyo; Takeji Hashimoto, and Hirofumi Tano, both of Kyoto, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo and Dainippon Screen Mfg. Co., Ltd., Kyoto, both of Japan

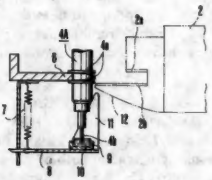
Filed Jan. 23, 1985, Ser. No. 693,933

Claims priority, application Japan, Feb. 14, 1984, 59-19700[U]

Int. Cl.⁴ G01D *15/16*

U.S. Cl. 346—29 **8 Claims**





1. An apparatus for plotting markings with drawing needle pens when used and for preventing drying-up of the pens containing ink and pen tips thereof prior to use, comprising

a plotting plane on which desired markings are drawn by the pens;

a pen carriage for holding a selected drawing needle pen to be used, said carriage being connected with at least one motor and being movable longitudinally and laterally relative to said plotting plane;

storing means for storing at least one of the drawing needle pens, said storing means including a supporting member for holding the pens prior to use; and

anti-dry means for preventing the pen tips of the drawing needle pens containing ink and stored in said storing means from drying-up, said anti-dry means being disposed in said storing means and comprising a pad having elastic and hermetic properties made of non-porous closed-cells, into which pad said pen tips are insertable and hermetically sealed by the pad for preventing drying-up of ink in the pens and tips.

4,628,327

PHYSIOLOGICAL TREND DATA RECORDER

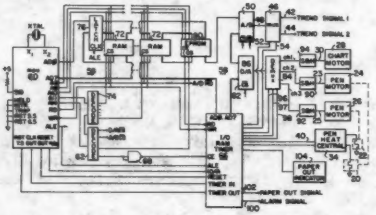
Donald G. Anderson, Meriden, Conn., and Elisa M. Ferrara-Jordan, Longmeadow, Mass., assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 398,019, Jul. 14, 1982, Pat. No. 4,513,294. This application Jan. 24, 1985, Ser. No. 694,547

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.[4] G01D *9/00*; A61B *5/04*

U.S. Cl. 346—33 ME **2 Claims**



1. A strip chart recorder responsive to the occurrence of an alarm condition for recording first and second trend signals representative of a physiological condition on one strip chart comprising:

recording means operable for recording the first and second trend signals on the strip chart at different rates in response to first and second rate signals, respectively;

storing means for storing said first trend signal representative of said physiological condition in the past; and

controlling means operable for controlling the storing means so as to provide the stored first trend signal to the recording means in response to the occurrence of an alarm condition and for providing the first rate signal, the second rate signal and the second trend signal to the recording means; said second trend signal representative of the physiological condition at points in time subsequent to those represented by the first trend signal and being provided to the recording means after recordation of the first trend signal.

4,628,328

THERMOMAGNETIC RECORDING APPARATUS

Yuichi Takahashi, Ebina; Akira Tasaki, Ibaragi; Teruhiko Itami, and Shunsuke Tomiyama, both of Ebina, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

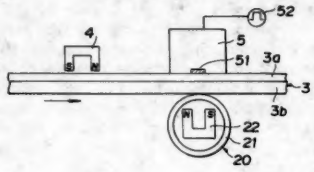
Filed May 6, 1985, Ser. No. 730,387

Claims priority, application Japan, Jul. 6, 1984, 59-140385

Int. Cl.[4] G01D *15/12*

U.S. Cl. 346—74.4 **7 Claims**

1. A thermomagnetic recording apparatus comprising a heating head array driven in response to a printing signal, a magnetic recording layer previously magnetized in a prescribed direction on which a latent magnetic image is formed by heat generation of said heating head array, developing means for developing said latent magnetic image with a magnetic toner, transferring means for transferring a toner image developed to a recording medium, and fixing means for fixing the image transferred, said magnetic recording layer having a



chemical composition which provides the magnetic material and has a Curie point which varies in response to the ratio of the chemical constituents in said chemical composition, said Curie point being set higher than the ambient temperature by a prescribed value dependent on the ratio of said chemical constituents, said chemical composition forming said magnetic recording layer having a hardness lower than the hardness of the heat generating element of the heating head array.

4,628,329

CIRCUIT FOR FEEDING INK TO AN INK-JET PRINTING HEAD

Luc Regnault, Bourg les Valence, France, assignor to Image S.A., Bourg les Valence, France

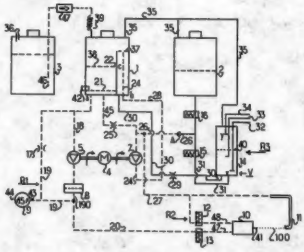
PCT No. PCT/FR84/00228, § 371 Date May 23, 1985, § 102(e) Date May 23, 1985, PCT Pub. No. WO85/01696, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 11, 1984, Ser. No. 740,049

Claims priority, application France, Oct. 13, 1983, 83 16440

Int. Cl.[4] G01D *15/18, 18/00*

U.S. Cl. 346—75 **8 Claims**



1. A circuit for feeding ink to an ink-jet printing head comprising an ink reservoir, said reservoir having a bottom wall, a first pipe connected at one end thereof to a first outlet in said bottom wall, a pressurizing pump connected to another end of said first pipe so that ink is supplied thereto, communication means connecting said pressurizing pump to said printing head for supplying ink thereto, a wetting pipe connected at one end thereof to a second outlet in said bottom wall, a depressurizing pump connected to another end of said wetting pipe, a recovery trough positioned to receive unused ink from said printing head in fluid communication with said depressurizing pump for drawing ink therefrom, means connecting said depressurizing pump with an inlet to said reservoir for conveying said unused ink to said reservoir, and a viscosimeter placed at a lower level than said reservoir comprising a vessel, three electrodes ex-

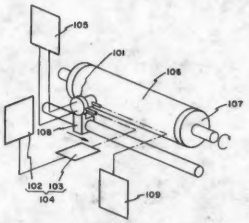
tending downwardly within said vessel, each electrode terminating at a different fluid level so as to detect a top fluid level and a bottom fluid level, whereby filling time between the bottom fluid level and the top fluid level can be determined and thereby the viscosity of the ink, and means for adding solvent to said viscosimeter when a reference value of the viscosity considered as a limit is attained.

4,628,330

INK-JET RECORDING APPARATUS

Michihisa Suga, and Mitsuo Tsuzuki, both of Tokyo, Japan, assignors to NEC, Japan

Continuation of Ser. No. 724,047, Apr. 18, 1985, abandoned, which is a continuation of Ser. No. 449,620, Dec. 12, 1982, abandoned. This application Jan. 24, 1986, Ser. No. 822,695
Claims priority, application Japan, Dec. 14, 1981, 56-201270
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **1 Claim**



1. An ink on demand ink-jet printer for producing a recording responsive to picture signals, said printer comprising recording head means for directing ink toward a recording medium, said recording head means having a chamber with a jet nozzle leading directly out of said chamber with no intervening passageway between said chamber and said nozzle, pressurized ink supply means upstream of said head and coupled through a passageway leading into said chamber and jet nozzle, the pressure of said ink supply being greater than atmospheric pressure, valve means forming part of said chamber and being interposed in said ink passageway system between said supply means and said jet nozzle, said valve means comprising a diaphragm controlled by a piezoelectric means located on said diaphragm and operated responsive to picture signals for selectively operating said valve means to open said passageway to enable said pressurized ink supply to expel ink from said chamber and nozzle when said picture signals call for a deposit of ink on a recording medium, said valve means closing said passageway to terminate the expulsion of said pressurized ink when said picture signal does not call for a deposit of ink on a recording medium, said piezoelectric means causing said diaphragm to increase the volume of said chamber to open said valve so that said upstream ink supply may expel a drop of ink from said nozzle and decreasing the volume of said chamber to close said valve, and means extending from said chamber at a point between said diaphragm and said nozzle for scavenging any excess ink which may accumulate.

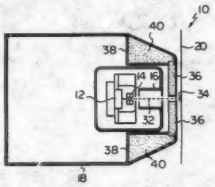
4,628,331

INK MIST COLLECTION APPARATUS FOR INK JET PRINTER

Chuji Ishikawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 18, 1981, Ser. No. 322,621
Claims priority, application Japan, Nov. 18, 1980, 55-162193
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **10 Claims**

1. An ink jet printing apparatus comprising:
an ink jet head for ejecting a jet of ink;
charging means for electrostatically and selectively charging ink droplets separated from the ink jet;
deflection means for electrostatically deflecting the charged ink droplets; and
ink mist adsorbing means interposed between a paper sheet and said ink head for adsorbing an ink mist produced by said charged ink droplets upon impingement of the ink droplets on the paper sheet;
said ink adsorbing means comprising a first adsorptive member disposed between the paper sheet and deflection means and a second adsorptive member which is held in contact with the first adsorptive member to thereby adsorb the ink mist which is adsorbed by the first adsorptive member;



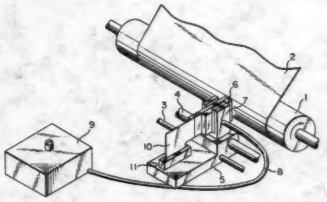
the adsorption capacity of said second adsorptive member being larger than that of said first adsorptive member, the second adsorptive member extending outwardly from the first adsorptive member in a direction perpendicular to the ink jet.

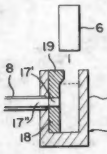
4,628,332

INK PRINTHEAD WITH HOLDER MOUNT

Haruyuki Matsumoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,167
Claims priority, application Japan, Jan. 30, 1984, 59-13315
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **13 Claims**





1. A liquid jet recording apparatus comprising:
a recording head for discharging recording liquid as flying liquid droplets,
a head mounting portion for fixing said recording head,
fixing means disposed interiorly of said head mounting portion and including an elastic material for removably at-

taching said recording head to said head mounting portion, and

liquid supply means including an opening extending through said head mounting portion and said fixing means for supplying recording liquid to said recording head.

4,628,333

INK JET RECORDING HEAD AND INK JET RECORDER

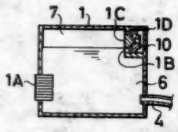
Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1984, Ser. No. 679,405

Claims priority, application Japan, Dec. 29, 1983, 58-249393; Dec. 29, 1983, 58-249394

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R 11 Claims



1. An ink jet recording head comprising:

a nozzle for discharging ink;

an ink chamber for supplying ink to said nozzle; and

a valve mechanism actuated by a vacuum arranged in said ink chamber, wherein an air layer is created in said ink chamber as ink is supplied thereto.

4,628,334

INK JET PRINT HEAD CARTRIDGE ASSEMBLY

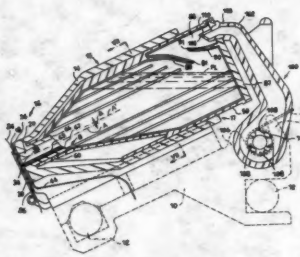
Giandomenico Dagna, Ivrea, and Franco Morin, Banchette, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Feb. 15, 1985, Ser. No. 702,061

Claims priority, application Italy, Feb. 15, 1984, 67137 A/84

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R 18 Claims



8. An ink jet printing head for printing in a variety of colours, wherein the ink is selectively projected onto a printing carrier through a plurality of nozzles, comprising a holder for removably housing a plurality of separate cartridges, each containing an ink conduit normally closed by a diaphragm, said holder being closed at one end by a front wall portion carrying a nozzle plate facing said printing carrier and being open at the opposite end to permit the cartridges to be separately inserted in and removed from the holder, said front wall carrying hollow engaging elements each one aligned and communicating with a corresponding nozzle, whereby upon the insertion of a single cartridge in said holder, said engaging element penetrates into said conduit by perforating said diaphragm to permit said ink to reach said nozzle.

4,628,335

HEAT-SENSITIVE RECORDING MATERIAL

Akira Igarashi; Kenji Ikeda, and Kensuke Ikeda, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1985, Ser. No. 781,575

Claims priority, application Japan, Sep. 28, 1984, 59-203822; Oct. 18, 1984, 59-219040; Oct. 18, 1984, 59-219044; Oct. 19, 1984, 59-220144; Dec. 14, 1984, 59-264184

Int. Cl.[4] B41M *5/18*

U.S. Cl. 346—208 11 Claims

1. A heat-sensitive recording material comprising a support and a heat-sensitive color forming layer containing a colorless or pale colored electron donating dye precursor and an electron accepting compound that reacts with said dye precursor to develop color, wherein said electron accepting compound is a bishydroxycumylbenzene or bishydroxy-α-methylbenzylbenzene compound.

4,628,336

THERMOSENSITIVE RECORDING SHEET

Toshimi Satake; Toshiaki Minami; Fumio Fujimura, all of Tokyo; Satoshi Oda, and Masato Magami, both of Nakatsu, all of Japan, assignors to Jujo Paper Co., Ltd., Tokyo and Yoshitomi Pharmaceutical Industries Ltd., Osaka, both of Japan

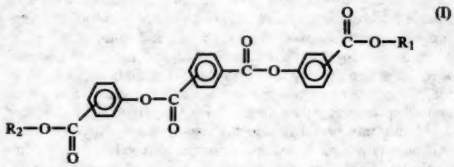
Filed Jul. 11, 1985, Ser. No. 753,905

Claims priority, application Japan, Jul. 18, 1984, 59-147684

Int. Cl.[4] B41M *5/18*

U.S. Cl. 346—209 8 Claims

1. A thermosensitive recording sheet having a thermosensitive color developing layer containing a basic leuco dye and an organic color developer, said layer containing a polyphenyl ester compound of the general formula



wherein R^1 and R^2, independently from each other, represent an alkyl group, a cycloalkyl group, or an aryl, aralkyl or aryloxyalkyl group which may have at least one substituent selected from the class consisting of halogen atoms, nitro groups, hydroxyl groups, lower alkyl groups and lower alkoxy groups.

4,628,337

REVERSIBLE IMAGE-FORMING MATERIAL

Mikiya Sekine, Warabi; Toshihiko Matsushita, Tokyo; Sadao Morishita, Ibaraki, and Yasuhiko Oiri, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills, Ltd. and Nippon Hoso Kyo Kai, both of Tokyo, Japan

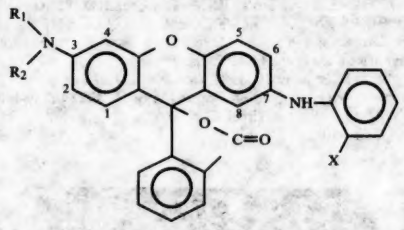
Filed Mar. 14, 1985, Ser. No. 711,837

Claims priority, application Japan, Mar. 15, 1984, 59-50069; Jun. 1, 1984, 59-112261; Jun. 4, 1984, 59-115233

Int. Cl.[4] B41M *5/18*

U.S. Cl. 346—217 14 Claims

1. A reversible image-forming material capable of forming black colored images by a thermal head and conversely erasing the formed images by water or moisture which comprises a support having provided on one surface thereof a recording layer comprising at least one fluorane color former represented by general formula (I):



(I)

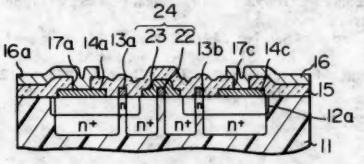
wherein R_1 and R_2 each represents an alkyl group and X represents a halogen atom; at least one color developer selected from the group consisting of gallic acid and phlorglucinol; and a binder and further having provided an overcoat layer on said recording layer.

4,628,338

SEMICONDUCTOR DEVICE

Yoshiro Nakayama, Yokohama, and Hidetake Suzuki, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 437,125, Oct. 28, 1982, abandoned. This application Sep. 25, 1985, Ser. No. 779,618
Claims priority, application Japan, Oct. 29, 1981, 56-174038
Int. Cl.[4] H01L *29/48, 29/80*
U.S. Cl. 357—15 **16 Claims**



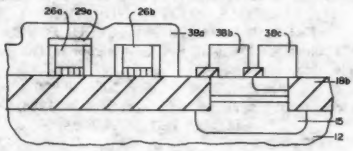
1. A semiconductor device comprising:
a semiconductor layer;
an n-type active area partially surrounding a portion of said semiconductor layer;
an electrode including:
a first part, formed on and in contact with said portion of said semiconductor layer partially surrounded by said n-type active area and comprising a material selected from the group consisting of high melting point metals and a silicide of the group of high melting point metals, for making Schottky contact with said semiconductor layer; and
a second part, formed on and in contact with a portion of said n-type active area and on and in contact with said first part of said electrode, and comprising a material different from said material of said first part of said electrode, for making ohmic contact with said portion of said n-type active area, said first and second parts of said electrode contacting each other over said semiconductor layer, and said entire electrode, comprising said first and second parts, acting as an ohmic electrode for said portion of said n-type active area.

4,628,339

POLYCRYSTALLINE SILICON SCHOTTKY DIODE ARRAY

Madhukar B. Vora, Los Gatos, and Hemraj K. Hingarh, San Jose, both of Calif., assignors to Fairchild Camera & Instr. Corp., Cupertino, Calif.

Continuation of Ser. No. 537,136, Sep. 29, 1983, which is a division of Ser. No. 233,348, Feb. 11, 1981. This application Nov. 4, 1985, Ser. No. 794,586
Int. Cl.[4] H01L *29/48, 27/12, 27/10, 29/04*
U.S. Cl. 357—15 **22 Claims**



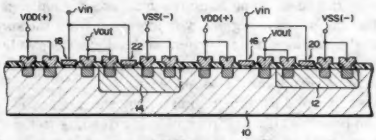
1. A Schottky diode comprising:
a substrate;
an insulating layer formed over said substrate;
a layer of metal silicide formed over said insulating layer;
a layer of polysilicon formed over said metal silicide and self-aligned with the edges thereof and in contact with said metal silicide;
a wall of insulating material formed over all exposed polysilicon and silicide surfaces except the entire top surface of said polysilicon; and
a layer of metal in contact with said top surface of said polysilicon.

4,628,340

CMOS RAM WITH NO LATCH-UP PHENOMENON

Kazuhiko Hashimoto, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 22, 1983, Ser. No. 468,209
Int. Cl.[4] H01L *29/78, 27/02*
U.S. Cl. 357—42 **5 Claims**



1. A complementary-symmetry MOS RAM-type semiconductor device for use in applications having peripheral systems, the device having a circuit for interacting with the peripheral systems as well as a circuit to provide the RAM function, the device comprising:
a semiconductor substrate of a first conductivity type;
a first well region of a second conductivity type which is formed in the surface region of said substrate;
a second well region of a second conductivity type which is formed in the surface region of said substrate with a smaller resistance per unit area than said first well region;
a first complementary-symmetry MOS circuit formed of said first well region and substrate; and
a second complementary-symmetry MOS circuit formed of said second well region and substrate,
wherein said first complementary-symmetry MOS circuit constitutes the RAM function circuit and said second complementary-symmetry MOS circuit constitutes the peripheral systems interaction circuit, for suppressing the

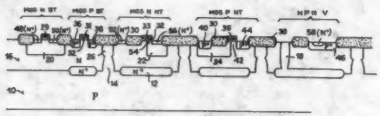
occurrence of latch-up without decreasing the degree of integration of said semiconductor device.

4,628,341

INTEGRATED CIRCUIT STRUCTURE COMPRISING CMOS TRANSISTORS HAVING HIGH BLOCKING VOLTAGE CAPABILITY AND METHOD OF FABRICATION OF SAID STRUCTURE

Gilles Thomas, Le Fontanil, France, assignor to Thomson CSF, Paris, France

Filed Sep. 27, 1985, Ser. No. 780,980
Claims priority, application France, Sep. 28, 1984, 84 14988
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—42 **2 Claims**



1. An integrated circuit structure incorporating low-voltage n-channel and p-channel MOS transistors and high-voltage n-channel and p-channel MOS transistors, comprising

a semiconductor wafer formed by a substrate covered with a lightly doped n-type epitaxial layer;

first lightly doped p^- type regions extending from the surface of the semiconductor wafer to part of the depth of the epitaxial layer, these regions being such as to constitute compartments in which are formed the source, the drain and the channel of low-voltage n-channel MOS transistors;

heavily doped p^+ type regions which are of smaller depth than the p^- type regions, which extend from the surface of the semiconductor wafer, and which constitute the source and the drain of the p-channel MOS transistors;

heavily doped n^+ type regions which are of smaller depth than the p^- type regions, which extend from the surface of the semiconductor wafer, and which constitute the source and the drain of the n-channel MOS transistors; wherein provision is also made for:

at least a second p^- type region having the same concentration profile as the first regions and extending to the same depth, said second region being adapted to surround an n^+ type source region and to constitute a channel region of a high-voltage n-channel MOS transistor which further comprises an n^+ type drain region located outside the second region and in spaced relation thereto so as to permit the existence of a lightly doped n-type epitaxial layer zone not directly controlled by the transistor gate between said drain region and said second region;

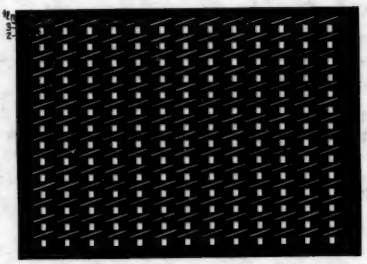
at least a third p^- type region having the same concentration profile as the first and second regions and extending to the same depth, said third region being adapted to surround a p^+ type drain region of a high-voltage p-channel MOS transistor in which the channel region is constituted by a lightly doped n-type epitaxial layer region adjacent to the third region, the p^+ type drain region of said transistor being in spaced relation to the channel region so as to form between these latter a zone of the third region which is not directly controlled by the transistor gate, and the source region of said transistor being located outside said third region.

4,628,342

OPTICAL TEST PATTERN FOR CORRECTING CONVERGENCE DEFECTS OF A COLOR CAMERA

Gerard Desmons, and Gilles Marchand, both of Paris, France, assignors to Thomson CSF, Paris, France

Filed May 10, 1983, Ser. No. 493,272
Claims priority, application France, May 14, 1982, 82 08486
Int. Cl.[4] H04N *17/00*
U.S. Cl. 358—10 **11 Claims**



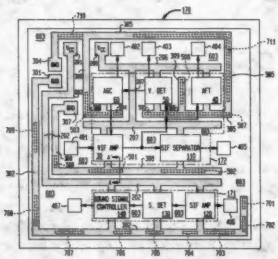
1. An optical test pattern for correcting convergence defects of a color camera, said test pattern comprising an integer number LN of identical pattern elements (1_{1N}) each disposed within one of LN rectangles resulting from a camera-screen lattice arrangement formed by L groups each consisting of M lines and N columns, each said pattern element being constituted by one vertical pattern component and one diagonal pattern component.

4,628,343

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE FREE FROM MUTUAL INTERFERENCE BETWEEN CIRCUIT BLOCKS FORMED THEREIN

Yuji Komatsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 549,604, Nov. 7, 1983. This application Mar. 31, 1986, Ser. No. 846,822
Claims priority, application Japan, Nov. 8, 1982, 57-195480
Int. Cl.[4] H01L *23/50, 27/06*
U.S. Cl. 357—84 **7 Claims**



1. A semiconductor device comprising a semiconductor body, an isolation region formed in said semiconductor body and partitioning said semiconductor body into at least two surface areas, a plurality of first circuit elements formed in one of said at least two surface areas to define a first circuit block which processes a first signal of a first frequency, a plurality of second circuit elements formed in another of said at least two surface areas to constitute a second circuit block which processes a second signal of a second frequency different from said first frequency, a first wiring layer formed on said semiconduc-

tor body for supplying a first operating voltage to said first circuit block, a second wiring layer formed on said semiconductor body separately from said first wiring layer and supplying a second operating voltage to said first circuit block, said second wiring layer having a portion extended along said isolation region between said one surface area and said another surface area, said extended portion of said second wiring layer being connected to said isolation region between said one surface area and said another surface area, a third wiring layer formed on said semiconductor body separately from said first and second wiring layers and supplying said first operating voltage to said second circuit block independently of said first wiring layer, said third wiring layer having a portion extended along said isolation region between said one surface area and said another surface area in parallel to said extended portion of said second wiring layer, said extended portions of said second and third wiring layers preventing a signal crosstalk between said first and second circuit blocks, and a fourth wiring layer formed on said semiconductor body separately from said first, second and third wiring layers and supplying said second operating voltage to said second circuit block independently of said second wiring layer.

4,628,344

METHOD AND APPARATUS FOR ENCODING AND DECODING VIDEO

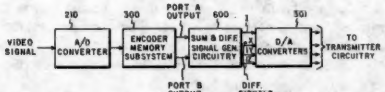
William E. Glenn, Fort Lauderdale, Fla., assignor to New York Institute of Technoloy, Old Westbury, N.Y.

Continuation-in-part of Ser. No. 418,055, Sep. 14, 1982, Pat. No. 4,517,597. This application Apr. 8, 1983, Ser. No. 483,126

The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.

Int. Cl.⁴ H04N *11/06*

U.S. Cl. 358—12 **18 Claims**



1. Apparatus for encoding and decoding a video signal, comprising:

(A) an encoder, including:

means responsive to said video signal for deriving a representation of low spatial frequency components of the images represented by said video signal;

means responsive to said video signal for deriving a representation which includes high spatial frequency components of the images represented by said video signal;

means for producing output frames of said low spatial frequency component representation at a fast frame refresh rate;

means for producing output frames of said high spatial frequency component representation at a slow frame refresh rate in the range of 3 to 15 frames per second; and

means for delaying said output frames of low spatial frequency component representation with respect to said output frames of high spatial frequency component representation; and

(B) a decoder, including means for combining the low spatial frequency component representation with the high spatial frequency component representation to obtain a decoded video signal.

4,628,345

CIRCUIT FOR ANALOG DIGITAL CONVERSION OF A COLOR TELEVISION SIGNAL EMPLOYING VARIABLE SIGNAL AMPLIFICATION

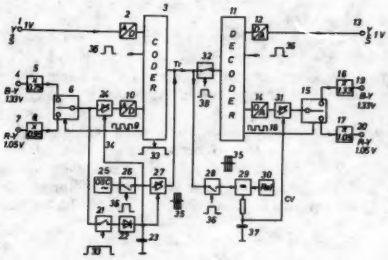
Erich Geiger, Unterkirnach; Bernhard Otto, VS-Rietheim, and Jürgen Kaaden, VS-Pfaffenweiler, all of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 651,272

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333071

Int. Cl.⁴ H04N *11/04, 9/68*

U.S. Cl. 358—13 **19 Claims**



12. A circuit for analog to digital conversion of a color television signal, which includes in three different paths (1, 4, 7) a signal relating to a luminous density (Y), a first and a second chrominance signal (B-Y), (R-Y), where the chrominance signals alternate going from line to line, characterized in that

in each case the signal fed to an analog digital converter (2,6) is controlled in its amplitude by a set parameter (Us) derived from the original amplitude of the signal such that the signal assumes always about the full control amplitude region of a converter (10) and that the set parameter (Us) is transmitted with a control signal via the transmission line (U) fed by the converter (10) and the set parameter serves for feedback controlling the amplitude of the signal to the original amplitude (amplifier 31).

4,628,346

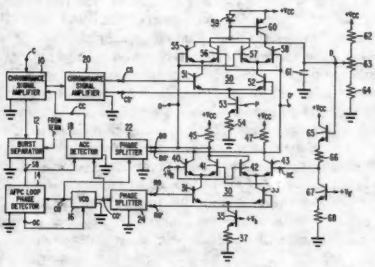
ELECTRICAL SERVO SYSTEM HAVING MANUAL OVERRIDE AFFECTING SERVO LOOP GAIN

Leopold A. Harwood, Bridgewater, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1984, Ser. No. 605,250

Int. Cl.⁴ H04N *9/64*

U.S. Cl. 358—28 **4 Claims**



1. An electrical servo system including a source of electrical

signals, and means for processing said electrical signals, said signal processing means having a control voltage input terminal and providing a processed signal output having a parameter subject to variation in accordance with the voltage applied to said control voltage input terminal; said system comprising:

means forming a servo control loop for opposing departures of said parameter of the processed signal output of said signal processing means from a predetermined relationship with a reference parameter; said servo control loop forming means including detector means, responsive to said processed signal output and to a reference signal indicative of said reference parameter, for developing a control voltage indicative of the magnitude and sense of such departures, and means for utilizing said control voltage to alter the voltage at said control voltage input terminal of said processing means in a sense tending to reduce the departure;

a DC voltage source;

manually adjustable means, coupled to said DC voltage source, for deriving from said DC voltage source a DC voltage of a magnitude adjustable within a predetermined range of magnitudes; and

means for rendering the voltage appearing at said control voltage input terminal responsive to the adjustable magnitude of said derived DC voltage while concomitantly rendering the gain of said servo control loop responsive to the adjustment condition of said manually adjustable means.

4,628,347

CHARGE TRANSFER DEVICE FOR MULTIPLEXING SIGNALS

Maki Sato, Sagamihara, and Takeo Hashimoto, Machida, both of Japan, assignors to Sony Corporation, Tokyo, Japan

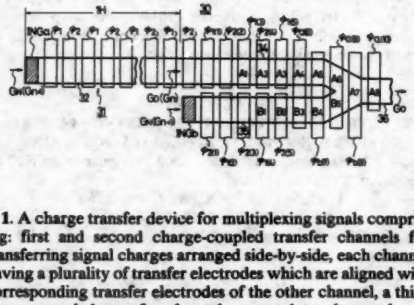
PCT No. PCT/JP83/00150, § 371 Date Jan. 19, 1984, § 102(e) Date Jan. 19, 1984, PCT Pub. No. WO83/04344, PCT Pub. Date Dec. 8, 1983

PCT Filed May 19, 1983, Ser. No. 576,372

Claims priority, application Japan, May 21, 1982, 57-86258

Int. Cl.[4] H04N *9/64, 9/077;* **H01L** *29/78;* **G11C** *19/28*

U.S. Cl. 358—39 **2 Claims**



1. A charge transfer device for multiplexing signals comprising: first and second charge-coupled transfer channels for transferring signal charges arranged side-by-side, each channel having a plurality of transfer electrodes which are aligned with corresponding transfer electrodes of the other channel, a third charge-coupled transfer channel arranged to alternately receive signal charges from said first and second charge-coupled transfer channels and having a plurality of transfer electrodes, said transfer electrodes of said first and second charge-coupled channels receiving first clock signals with said corresponding aligned transfer electrodes receiving said first clock signals at different phases, said transfer electrodes of said third charge-coupled transfer channel receiving second clock signals which have a frequency of two times said first clock signals, wherein a pair of input signals is applied to said first and second charge-coupled transfer channels and an output means receives an output of said third charge-coupled transfer channel.

2. A charge transfer device for multiplexing signals comprising: first, second and third charge-coupled transfer channels for transferring signal charges arranged side-by-side, a fourth charge-coupled transfer channel arranged to alternately receive signal charges from said first, second and third charge-coupled transfer channels, a first plurality of transfer electrodes extending transversely over said first, second and third transfer channels, each of said first plurality of transfer electrodes having portions longitudinally offset from each other such that a particular transfer electrode portion over said first transfer channel is offset from a transfer electrode portion over said second transfer channel which in turn is offset from a transfer electrode portion over said third transfer channel, a second plurality of transfer electrodes extending transversely over said, first, second and third transfer channels, and a third plurality of transfer electrodes extending over said fourth transfer channel.

4,628,348

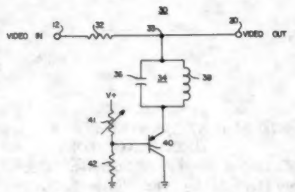
LUMINANCE CLIPPER WITH COLOR SUBCARRIER FILTER TO PREVENT CLIPPING OF SUBCARRIER

James W. Ensinger, Roselle, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Apr. 2, 1985, Ser. No. 718,682

Int. Cl.[4] H04N *9/77, 5/16*

U.S. Cl. 358—39 **3 Claims**



1. In combination:

an input terminal in which is developed a baseband color video signal, including a luminance component and a carrier-based chrominance component;

first means coupled to said terminal responsive to said chrominance component; and

second means coupled to said terminal for maintaining the amplitude of signal applied thereto below a predetermined threshold voltage;

said first means and said second means being connected in a series circuit with said terminal;

said second means being a clipper for keeping said luminance component below said predetermined threshold voltage;

said first means rendering said second means ineffective for said chrominance component to maintain the amplitude of said luminance component below said predetermined threshold voltage while enabling passage of said chrominance component in substantially unchanged condition.

4,628,349

VIDEO-INDEX SIGNAL MIXER

Richard W. Midland, Inverness, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Apr. 9, 1985, Ser. No. 721,721

Int. Cl.[4] H04N *9/24, 9/22*

U.S. Cl. 358—67 **6 Claims**

1. A video amplifier-index signal mixer for a wide-band beam index system including a CRT comprising:

video switch means for controlling the amplitude of signal applied to said CRT, said video switch means having first and second inputs;

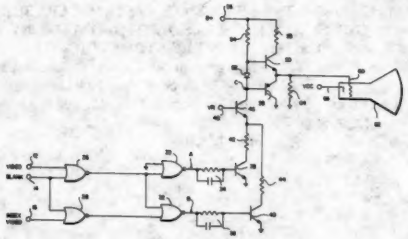
video signal means enabled responsive to a video signal, coupled to the first of said inputs;

index signal means, enabled responsive to an index signal, coupled to the second of said inputs;

said video switch means being driven conductive by either

said video signal means or said index signal means being enabled; and

gate means interconnecting said video signal means and said



index signal means for enabling said index signal means whenever said video signal means is enabled, whereby during occurrence of a video signal, both said inputs to said video switch means are enabled.

4,628,350

IMAGE ENHANCEMENT

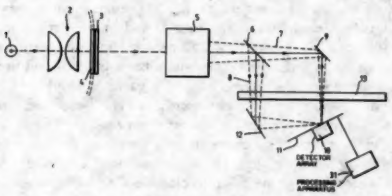
John E. Aughton, London, and Robert J. Oldershaw, Norfolk, both of England, assignors to Crosfield Electronics (USA) Limited, London, England

Filed Aug. 16, 1985, Ser. No. 766,320

Claims priority, application United Kingdom, Aug. 24, 1984, 8421512

Int. Cl.⁴ H04N *1/46*

U.S. Cl. 358—75 **9 Claims**



1. Scanning apparatus for generating signals representing color components of successively scanned picture elements of an original colored image, said apparatus comprising a light source adapted to generate a light beam; means for causing relative movement between said original image and a light beam generated by said light source whereby successive picture elements of said original image are scanned; means for generating a sharp light beam for each color component of each said element; means for generating an unsharp light beam for at least one color component of each said element; common detection means for receiving said sharp and unsharp light beams and for providing corresponding output signals; and sequencing means for causing said sharp and unsharp beams sequentially to impinge on said detection means.

4,628,351

COOKING APPARATUS WITH A VIDEO DISPLAY

Man Y. Heo, Daegu, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Apr. 23, 1984, Ser. No. 603,138

Int. Cl.⁴ H04N *5/645*

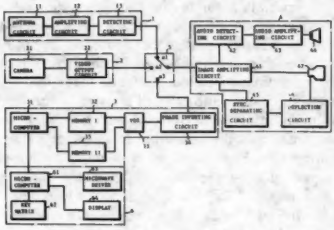
U.S. Cl. 358—93 **3 Claims**

1. A cooking apparatus with a video display, comprising

(a) a television processing means for processing a first video signal,

(b) a camera-image processing means for processing a second video signal from a video camera,

(c) a heat-controlling means which performs general functions of a cooking apparatus characterized in that a micro-video processing means for converting automatic cooking information into a third video signal is connected to said heat-controlling means and is adapted to monitor said cooking apparatus during a cooking cycle, and



(d) an image-processing means for displaying said video signals, and

(e) a switching means connected to said television processing means, said camera-image processing means and said micom-video processing means to permit switching of each means for displaying said video signal according to the user's selection.

4,628,352

DEVICE FOR CORRECTING VIDEO SIGNALS IN A SYSTEM FOR ACQUISITION AND SCANNING OF FAST SIGNALS INVOLVING THE USE OF A STREAK CAMERA

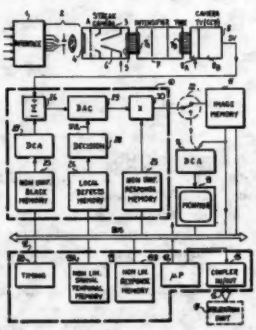
Philippe Boue, Villennes sur Seine, France, assignor to Thomson CSF, Paris, France

Filed Aug. 16, 1985, Ser. No. 767,772

Claims priority, application France, Aug. 21, 1984, 84 13018

Int. Cl.⁴ H04N *3/15, 5/335, 7/18*

U.S. Cl. 358—93 **8 Claims**



1. A system for acquisition and scanning of fast signals, which makes use of a streak camera upstream of a solid-state television camera and is equipped with a device for correcting the detected video signal, said signal being transmitted to a processing circuit comprising means for analog-to-digital conversion and digital-to-analog conversion, for storage in memory, for management and computation, for subtraction and

multiplication in order to correct defects of nonuniformity of black, local defects and defects of nonuniformity of response, in which the correction for nonuniformity of black is made by analog subtraction in a subtracting circuit and which also receives the video signal of the television camera and the data relating to correction for nonuniformity of black and stored in a first memory, correction for local defects being made by validation in the case of a correct element of the sensing matrix and by sampling of the signal corresponding to the preceding element if the element is defective, correction for nonuniformity of response being made by computation of a coefficient of proportionality and storage of said data in a second memory and by multiplication of the corresponding corrective term with a corrected video signal of the black, wherein the output of the subtracting circuit is connected to the multiplying circuit through an analog-to-digital converter which receives a signal for validation of local defects stored in a third memory, correction for nonuniformity of response being made in digital form in said multiplying circuit which delivers the corrected video signal via a digital output to an image memory in which it is stored, the means for management and computation being employed in order to produce from the data stored in the image memory data for correction of complementary defects represented by the defects of nonlinearity of response of the complete chain and by geometrical defects of spatial and temporal nonlinearities caused by the elements upstream of the television camera, said complementary data being stored in a fourth and fifth memory respectively.

4,628,353

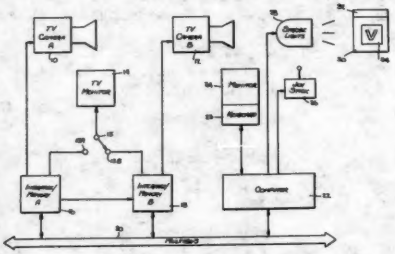
VIDEO MEASURING SYSTEM

Ray E. Davis, Jr., Old Lyme; Robert G. Foster, Clinton; Michael J. Westkamper, Oakdale; Dana L. Duncan, Old Lyme, and James R. Hall, Clinton, all of Conn., assignors to Chesebrough-Pond's Inc., Greenwich, Conn.

Filed Apr. 4, 1984, Ser. No. 596,842

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—107 **42 Claims**



1. A video measuring system comprising:

(a) a TV camera for taking a picture, said camera having a two-axis array of photosensors;

(b) interface/memory circuitry connected to said TV camera for digitizing and storing said picture;

(c) a digital computer connected to said interface/memory circuitry;

(d) a monitor connected to said computer for displaying the stored picture;

(e) a keyboard connected to said computer to permit an operator to communicate with said computer;

(f) means connected to said computer for locating a plurality of start search points for the picture on the monitor;

(g) means for storing the start search points;

(h) means for selecting and storing gradient thresholds for a plurality of points for the picture on the monitor, said gradient thresholds comprising digital numbers having both a sign and a magnitude; and

(i) means for storing the difference between a pair of points for the picture on the monitor.

4,628,354

IMAGE DATA TRANSMISSION SYSTEM CAPABLE OF REPRODUCING A HIGH RESOLUTION IMAGE BY THE USE OF A SIMPLE STRUCTURE

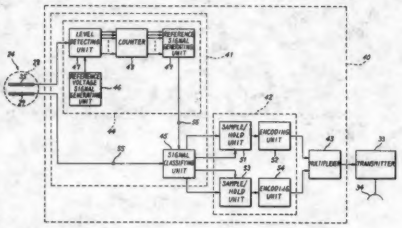
Riichi Nagura, Tokyo, assignor to NEC Corporation, Japan

Filed Mar. 14, 1985, Ser. No. 712,013

Claims priority, application Japan, Mar. 15, 1984, 59-49830; Jan. 21, 1985, 60-8609

Int. Cl.[4] H04N *7/13*

U.S. Cl. 358—109 **9 Claims**



1. In an image data transmission system for use in combination with a craft capable of flying along a flight path over an object zone, said image data transmission system comprising image pickup means carried by said craft for picking up optical images from said object zone to produce a succession of first image signals representative of the optical images and a succession of second image signals having a predetermined delay time relative to said first image signals and image processing means for processing said first and said second image signal successions into a processed signal succession, each of said first and said second image signals having a variable amplitude in dependency upon said optical images, the improvement wherein said image processing means comprises:

classifying means responsive to said first and said second image signal successions for classifying said amplitudes of said second image signals into classified signal successions falling within a predetermined number of amplitude ranges which are determined with reference to said first image signal succession, respectively;

encoding means coupled to said classifying means for individually encoding said classified signals into encoded signal successions, respectively; and

combining means for combining said encoded signal successions into said processed signal succession.

4,628,355

DIAGNOSTIC X-RAY APPARATUS

Ichiro Ogura; Motomu Suzuki, both of Otawara; Senzo Fujii, Nishinasuno, and Michitaka Honda, Otawara, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 29, 1983, Ser. No. 527,553

Claims priority, application Japan, Aug. 28, 1982, 57-149775

Int. Cl.[4] H05G *1/64;* H04N *5/32*

U.S. Cl. 358—111 **6 Claims**

1. A diagnostic X-ray apparatus for producing visible difference images from X-ray images obtained from pulsed X-ray radiation, comprising:

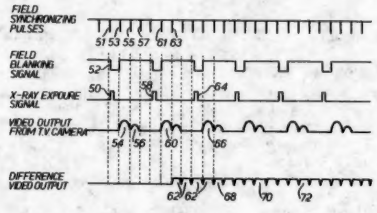
an X-ray generating source for emitting pulsed X-ray radiation to produce a pulsed X-ray image;

television means, including a television camera having a predetermined field rate, for converting said X-ray image into a series of analog video signals;

synchronizing means for generating field synchronizing signals at the field rate of said television camera;

exposure control means reponsive to said field synchronizing signals for generating X-ray exposure signals to control the exposure period of the pulsed X-ray radiation emitted from said X-ray generating source, said exposure period being less than the interval of said field synchronizing signals, and said exposure control means including means for generating field blanking signal synchronously with the exposure period of said X-ray generating source;

analog-to-digital converting means for converting into digital video signals said analog video signals corresponding to a complete television field image resulting from said



pulsed X-ray radiation and following said field blanking signals;

a digital memory system including means for storing said digital video signals in a predetermined sequence;

subtracting means for producing digital difference video signals by performing a subtraction between digital video signals recently stored and digital video signals previously stored in said digital memory system;

a digital-to-analog converter for converting said digital difference video signals from said subtracting means into analog difference video signals; and

display means for producing visible difference images corresponding to said analog difference video signals.

4,628,356

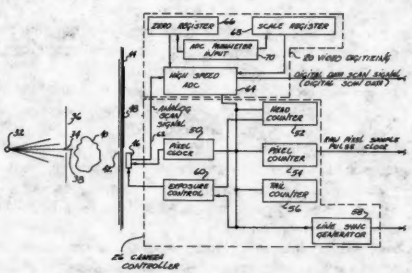
DIGITAL X-RAY SCANNER

Donald W. Spillman, Aurora, and Thomas W. Shilling, Littleton, both of Colo., assignors to Imagex, Inc., Aurora, Colo.

Filed Oct. 15, 1984, Ser. No. 660,853

Int. Cl.[4] H05G *1/64*; H04N *5/32*

U.S. Cl. 358—111 **8 Claims**



1. An X-ray imaging system for electronically detecting and imaging X-ray shadows of an object comprising:

X-ray source means for generating a generally rectangularly shaped X-ray beam;

scanning means for inducing relative motion between said object and said X-ray beam to produce said shadows of said object;

linear photosite detector array means for detecting said X-ray shadows of said object and producing an analog scan signal representative of said X-ray shadows;

video digitizing means for producing a digital scan signal in response to said analog scan signal, said video digitizing means comprising:

high speed analog to digital converter means for producing said digital scan data in response to said analog scan signal;

means for setting operational parameters of said high speed analog to digital converter means;

camera controller means for controlling exposure and clocking of said linear photosite detector array means comprising:

pixel clock means for generating pixel clock pulses;

exposure control means for setting the exposure time of said linear photosite detector array means;

pixel counter means for counting said pixel clock pulses to determine the number of pixels on each raster line;

line sync generator means for producing a line sync generator pulse at the end of each raster line of pixel data points;

raw data storage means for storing digital scan data from said digital scan signal;

data formatting means for mapping said digital scan data for storage in said raw data storage means and generating read address signals for reading said digital scan data from said raw data storage means;

means for selecting a predetermined window of said raw image data and retrieving said window of data from said storage means for display;

picture processing means for processing said digital scan data for display comprising:

data compression means for compressing said digital scan data in two dimensions to increase the amount of said data which can be displayed on a monitor;

means for processing said digital scan data to enhance an image formed by displaying said digital scan data;

display frame buffer means generating an analog image display signal comprising:

display look-up table means for storing said digital scan data in address locations corresponding to the positional location for display of said data on said monitor means and generating a binary signal corresponding to the magnitude of said digital scan data;

display address generator means for generating address signals of data to be displayed on said monitor means;

load address generator means for generating load address signals for storage of said digital scan data in said display look-up table means at said address locations corresponding to said positional locations for display of said data on said monitor means;

digital to analog converter means for generating said analog image display signal;

monitor means for electronically displaying said analog image display signal.

4,628,357

DIGITAL FLUOROGRAPHIC SYSTEMS

Paul Fenster, Petach Tikvah, Israel, assignor to Elscint, Ltd., Haifa, Israel

Filed Feb. 10, 1984, Ser. No. 579,202

Int. Cl.[4] H04N *5/32*

U.S. Cl. 358—111 **14 Claims**

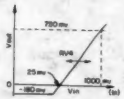
1. A digital fluorographic system for displaying radiographic images of objects; said system comprising:

an image acquisition section for acquiring video signals representative of images of the object, comprising:

image processing means for processing said video signals prior to display, said processing means including log amplifier means for amplifying said video signals by a log function, and

means for cutting off said amplified video signal at a value

above that corresponding to the zero input of said amplifier to improve the signal to noise ratio and to prevent



amplifications of signal errors close to the zero point on the response curve.

4,628,358

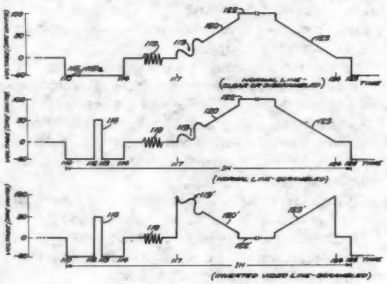
TELEVISION SIGNAL ENCRYPTION SYSTEM WITH PROTECTED AUDIO

Clyde N. Robbins, Fort Washington, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Jun. 10, 1983, Ser. No. 503,250

Int. Cl.[4] H04N *7/167*

U.S. Cl. 358—121 **12 Claims**



1. In combination in a system for communicating a television program which includes encrypted audio and video signals; signal originating means including a first pseudo random generator for generating an audio scrambling control signal, means for generating polarity inverted and non-inverted versions of the television audio signal, and selection means controlled by said first controlling means for operatively selecting for communication the polarity inverted or the non-inverted version of the television audio signal; and receier means including means for receiving the signal supplied by said selection means, said receiver means including a second pseudo random generator for generating a replica of said udio scrambling control signal, means for generating polarity inverted and non-inverted versions of the signal received by said receiving means, and additional selection means controlled by said second controlling means for operatively selecting for listening said inverted or non-inverted version of said received audio signal, whereby the output of said additional selection means comprises polarity restored audio, said signal originating means further including selective inversion means for selectively inverting the video information content of video lines about an inversion reference level and for not inverting the video information content of other lines, signal distribution means for distributing the output signal produced by said selective video inversion means, and means for distributing a measure of said inversion reference level with the composite signal distributed by said signal distribution means; and wherein said receiver means further includes means for receiving said composite signal from said signal distribution means; said decrypting means including inversion reference means for recovering the received video inversion reference level, and means for selectively reinverting the video information content of inverted video lines about the recovered inversion reference of said inversion reference means.

4,628,359

MEMORY SELECTING SYSTEM FOR SCRAMBLED TELEVISION RECEIVER

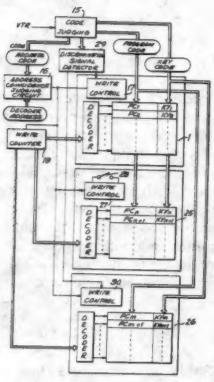
Takashi Okada, Yokohama, and Takao Mogi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,257

Claims priority, application Japan, Mar. 24, 1983, 58-49583

Int. Cl.[4] H04N *7/167*; G11B *5/02*

U.S. Cl. 358—122 **16 Claims**



11. Apparatus for descrambling signals transmitted in scrambled form that are to be recorded and reproduced and which include a scrambled television program, an identification code, a program code, and a descrambling key signal corresponding to the program code, the apparatus comprising:

temporary memory means for temporarily memorizing program codes and corresponding key codes when the scrambled transmitted signals are recorded;

permanent memory means for permanently memorizing program codes and corresponding key codes when scrambled transmitted signals are recorded;

means for detecting the identification code in said transmitted signals and selecting either said temporary memory means or said permanent memory means, respectively, for memorizing said program codes and corresponding key codes in response thereto;

means for comparing program codes memorized in said temporary memory means or in said permanent memory means with the program code of the scrambled signals being reproduced and choosing the one of the memorized program codes coinciding with said program code of the scrambled signals being reproduced;

means for generating a descrambling pattern based upon the memorized descrambling key code that corresponds to said one program code which is chosen; and

means for descrambling the reproduced scrambled signals in accordance with said descrambling pattern.

4,628,360

METHOD AND APPARATUS FOR DETERMINING THE IMAGE TRANSFER QUALITY OF AN IMAGING SYSTEM

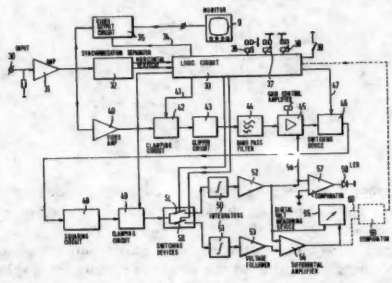
Adrianus Mook, Delft, and Ronald J. Geluk, Nootdorp, both of Netherlands, assignors to N.V. Optische Industrie "De Oude Delft" , Netherlands

Filed Feb. 21, 1984, Ser. No. 582,076

Claims priority, application Netherlands, Feb. 25, 1983, 8300725

Int. Cl.[4] H04N *17/00*

U.S. Cl. 358—139 26 Claims



1. A method of determining the image transfer quality of an imaging system on the basis of signal-to-noise ratio and including forming a television signal, characterized by: presenting to an input of said imaging system a reference pattern comprising at least two different portions, one portion of said reference pattern resulting, after formation of said television signal, in a first section of image carrying information of a television output signal and being a measure for occurrent noise, and another portion of said reference pattern resulting, after formation of said television signal, in a second section of image carrying information of said television output signal and comprising a like amount of said occurrent noise in combination with an image signal component; and comparing said first section of image carrying information associated with said one portion of said reference pattern with said second section of image carrying information associated with said other portion of said reference pattern to generate a signal-to-noise ratio.

4,628,361

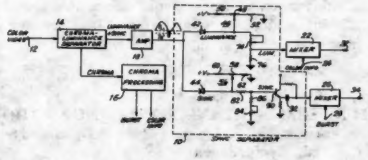
VIDEO SYNCHRONIZING SIGNAL SEPARATOR

Sam Andreas, Brooklyn, N.Y., assignor to Recoton Corporation, Long Island City, N.Y.

Filed Jan. 8, 1985, Ser. No. 689,645

Int. Cl.[4] H04N *5/08*

U.S. Cl. 358—153 10 Claims



1. A synchronizing signal separator for separating the luminance and synchronizing signal components from a composite video signal supplied thereto, comprising: first and second oppositely conductive diodes having an anode of one and a cathode of the other coupled to a common terminal to receive said composite video signal; first and second bias means coupled to said first and second diodes, respectively, to establish respective turn-off levels for said first and second diodes to render said respective first and second diodes non-conductive when said composite video signal crosses respective threshold voltage levels, at least one of said bias means including a source of voltage; adjustable resistance means coupled to said source of voltage to produce an adjustable bias voltage; means for applying said adjustable bias voltage to the cathode of said first diode; luminance output means comprising first variable attenuating means coupled to the cathode of said first diode for attenuating by a selected amount said luminance signal component to supply a luminance signal component substantially free of said synchronizing signal component; and synchronizing output means coupled to said second diode to supply a synchronizing signal component substantially free of said luminance signal component; whereby said first diode is conductive during the luminance signal interval of said composite video signal and is biased to non-conduction in response to said synchronizing signal component of said composite video signal, and said second diode is conductive during the synchronizing signal interval of said composite video signal and is biased to non-conduction in response to said luminance signal component of said composite video signal.

4,628,362

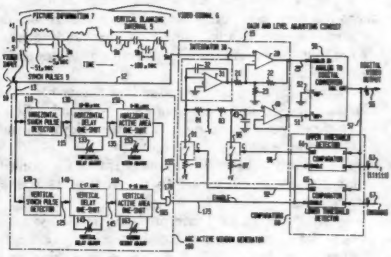
COMBINED VIDEO AGC AND DIGITIZING CIRCUIT

Glenn C. Waehner, New Canaan, Conn., assignor to American Dynamics Corporation, Orangeburg, N.Y.

Filed May 2, 1985, Ser. No. 729,813

Int. Cl.[4] H04N *5/53, 5/52, 5/57*

U.S. Cl. 358—174 16 Claims



1. A circuit, having an automatic gain control (AGC), for providing a digital output signal having digital values representing analog picture information in an incoming video signal, said incoming video signal also having vertical and horizontal synchronization pulses, said circuit comprising:

an analog-to-digital converter, having a dynamic range and a certain gain and operative in response to an analog input signal, for producing the digital output signal,

means, connected to said converter and operative in response to said incoming video signal and to at least one feedback signal, for producing the analog input signal and for ensuring that picture information contained in said analog input signal consumes substantially all of the dynamic range of the converter,

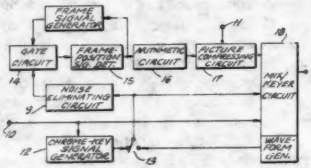
means, operative in response to the occurrence of said synchronization pulses for providing an enable signal and for selectively varying the starting time and duration of the enable signal so as to selectively define an active window, within a video image, on which the AGC is to operate; and

means, responsive to said digital output signal and to the enable signal, for comparing the digital values against predefined minimum and maximum values and, in response thereto, generating said feedback signal.

4,628,363
CHROMA-KEY TRACKING APPARATUS

Masahiro Kashiwa; Masashi Onosato, and Hiroshi Takahashi, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Nov. 21, 1983, Ser. No. 553,753
Claims priority, application Japan, Nov. 19, 1982, 57-203170
Int. Cl.[4] H04N 5/275, 9/74
U.S. Cl. 358—183 9 Claims



1. A tracking apparatus for inserting a first television picture into a part of a second television picture to obtain a special effect, comprising:

means responsive to a second television signal which is indicative to said second television picture for generating a key signal which represents an area of a television frame of said second television picture which is occupied by said first television picture;

noise eliminating means for removing from said key signal a picture noise component having a dimensional width which is less than a predetermined dimensional width value, said noise eliminating means measuring said picture noise component to determine the dimensional width thereof to produce a noise-free key signal;

means responsive to said noise free key signal from said noise eliminating means for detecting a surrounding frame surrounding the boundary of said frame represented by said key signal;

means responsive to said surrounding frame for producing an imaginary frame indicating a size to which a first television signal corresponding to said first television picture is to be compressed;

means responsive to said imaginary frame for compressing said first television signal to the size of said imaginary frame; and

means for inserting said compressed first television signal from said compression means into said second television signal corresponding to said second television picture in accordance with said key signal.

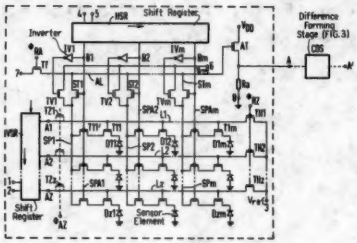
4,628,364
TWO-DIMENSIONAL SEMICONDUCTOR IMAGE SENSOR INCLUDING AN ARRANGEMENT FOR REDUCING BLOOMING

Rudolf Koch, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 28, 1983, Ser. No. 518,283
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3236073
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213 9 Claims

1. In a two-dimensional image sensor of the type wherein a plurality of sensor elements are carried in columns and rows by a doped semiconductor body, wherein row lines are selected by way of assigned parallel outputs of a row shift register to selectively drive first selection transistors respectively connected to the sensor elements for transmitting exposure-dependent sensor signals, formed in the sensor elements, over the first selection transistors to respective column lines, wherein the column lines are successively connected to a read-out line connected to a read output for reading the sensor signals via respective column selection transistors each serially connected to a respective first selection transistor and driven by parallel outputs of a column shift register, the improvement therein comprising:

second selection transistors each serially connected between a respective first selection transistor and a respective column line and connected to and driven by the outputs of the column shift register;



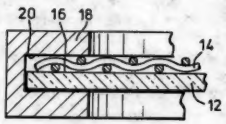
a plurality of switching transistors each serially connected between a respective column line and a reference potential; and

inverter means connecting the respective outputs of the column shift register to said switching transistors so that said column selection transistors and said switching transistors are inversely driven relative to one another.

4,628,365
RADIATION FILTER

Roger Carlton, Periphlex Inc., 5230 Finch Ave. E., Unit 5, Scarborough, Ontario, Canada (M1S 4P1)

Continuation of Ser. No. 540,932, Oct. 11, 1983, abandoned.
This application Mar. 17, 1986, Ser. No. 844,241
Int. Cl.[4] H04N 5/65, 5/72
U.S. Cl. 358—245 9 Claims



1. A radiation filter for the screen of a video display terminal comprising a transparent sheet of radiation absorbent material dimensioned to extend across and be disposed adjacent to said screen, an open mesh material juxtaposed on a surface of said sheet of radiation absorbent material directed away from said screen and means to secure said mesh to said sheet, said sheet of radiation absorbent material being interposed between said mesh and said screen to absorb radiation emitted therefrom, whereby light incident upon and transmitted through said sheet is absorbed by said mesh.

4,628,366
PICTURE SCANNING AND RECORDING METHOD

Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jun. 23, 1983, Ser. No. 507,719
Claims priority, application Japan, Jul. 12, 1982, 57-121460
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—280 2 Claims

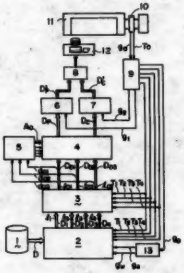
1. A method for recording a reproduced image in a desired layout based on image data obtained by photoelectrically scanning an original picture, a line drawing and a picture pattern existing mixedly in the reproduced image, the method comprising the steps of:

storing line drawing data and picture pattern data, obtained from photoelectrically scanning the original, in a memory

sequentially reading the image data, including the line drawing data and the picture pattern data, out of said memory in the order of record scanning lines, said image data being represented as an image signal for each picture element of the original picture in the form of one of said line drawing data or said picture pattern data, both being on data formats of equal length;

providing each of said data formats with a discrimination bit for discriminating whether the image data represented on a data format are line drawing data or picture pattern data;

arranging the image data of a required picture element on a



first scanning line to be recorded and the image data of a picture element on a scanning line adjacent to said first scanning line in the sequential order of scanning lines;

and discriminating the arranged image data and, when the image data of a first picture element on a central scanning line to be recorded are line drawing data when discriminated, outputting the picture pattern data of a picture element adjacent to said first picture element in a subscanning line to said first picture element by superimposing the picture pattern data on the line drawing data, the output of the picture pattern data being controlled per one picture element, and the output of the line drawing data being controlled per one subpicture element obtained by further dividing said first picture element.

4,628,367

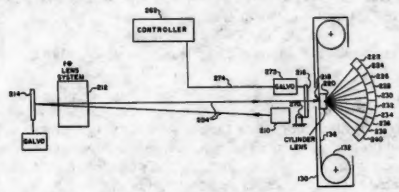
METHOD AND DEVICE FOR READING DIGITAL DATA IN AN OPTICAL MASS MEMORY SYSTEM USING ELECTROPHOTOGRAPHY

Manfred Kuehnle, New London, N.H.; Lysle D. Cahill, Dayton; John C. Butler, Centerville, both of Ohio, and Lawrence J. Bassuk, Des Plaines, Ill., assignors to Coulter Systems Corporation, Bedford, Mass.

Division of Ser. No. 489,309, Apr. 28, 1983, Pat. No. 4,515,879. This application Jan. 29, 1985, Ser. No. 696,027

Int. Cl.[4] H04N *1/04, 1/40*

U.S. Cl. 358—285 **6 Claims**



1. For use in an optical mass memory system, a method of reading digital data represented by a toned image carried by a transparent medium, the medium having a length and a width and the toned image being formed of opaque areas and at least translucent areas forming optically discernable elements arranged in a pattern on the medium, the digital data being represented by said elements, said method comprising:

providing a plurality of rays spaced from one another of radiant energy, each ray having a size just smaller than the size of said elements;

scanning said toned image with said rays by deflecting said rays across the width and length of said medium in a pattern corresponding to the pattern in which the elements are arranged on the medium;

sensing the radiant energy from each of said rays that is transmitted through said member at said at least translucent elements and converting the transmitted radiant energies into analog electrical signals; and

converting said analog electrical signals into digital electrical signals representing said digital data.

4,628,368

METHOD FOR CONTROLLING SUB-SCANNING OF DOCUMENT READING APPARATUS

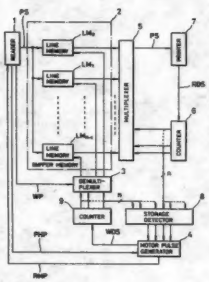
Masami Kurata; Tadashi Yamamoto, and Noriyoshi Ishikawa, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 11, 1984, Ser. No. 629,724

Claims priority, application Japan, Jul. 12, 1983, 58-126590

Int. Cl.[4] H04N *1/10*

U.S. Cl. 358—293 **14 Claims**



1. A method for controlling the movement speed of reading means in a document reading apparatus, said reading means having a certain weight and moving along a platen on which a document is supported so as to read picture information on said document in a line by line manner, said read picture information being temporarily stored in a buffer memory for subsequent utilization, comprising the steps of:

detecting the amount of picture information currently stored in said buffer memory not yet utilized, and

controlling said movement speed of said reading means according to said detected picture information to minimize the vibration of said reading means.

4,628,369

VIDEO SIGNAL DROPOUT COMPENSATION CIRCUIT

Yutaka Ichinoi, Yokohama, and Naomichi Nishimoto, Tokyo, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Mar. 12, 1984, Ser. No. 588,378

Claims priority, application Japan, Mar. 17, 1983, 58-44766

Int. Cl.[4] H04N *5/76, 9/493*

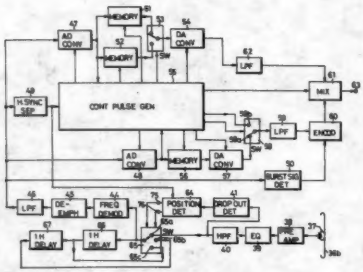
U.S. Cl. 358—314 **3 Claims**

1. A new video signal dropout compensation circuit in a reproducing apparatus which is designed to reproduce a re-

corded signal from a recording medium, said recording medium being recorded with a time-division-multiplexed signal which has been frequency modulated, each horizontal scanning period of said time-division-multiplexed signal comprising a first transmitting duration in which a time base compressed luminance signal is transmitted and a second transmitting duration in which a time base compressed line-sequential color difference signal is transmitted, said reproducing apparatus frequency-demodulating a reproduced frequency modulated time-division-multiplexed signal in a frequency demodulator, and time base expanding the time base compressed line-sequential color difference signal and the time base compressed luminance signal which are within the reproduced time-division-multiplexed signal back to an original time base so as to obtain a reproduced line-sequential color difference signal and a reproduced luminance signal, said dropout compensation circuit comprising:

a dropout detecting circuit for producing a dropout detection signal when said reproduced frequency modulated time-division-multiplexed signal assumes a level which is smaller than a preset predetermined level;

a position detecting circuit supplied with the output signal of said dropout detecting circuit for passing said dropout detection signal through a first output terminal when said dropout detection signal is supplied thereto within said first transmitting duration and for passing said dropout detection signal through a second output terminal when said dropout detection signal is supplied thereto within said second transmitting duration;



a switching circuit which is controlled in response to signals from said first and second output terminals of said position detecting circuit; and

delay means supplied with a signal which is selectively passed by said switching circuit for delaying said signal which is selectively passed by said switching circuit, said delay means comprising first and second delay circuits which are connected in series and respectively have a delay time of one horizontal scanning period,

said switching circuit comprising a first terminal supplied with said reproduced frequency modulated time-division-multiplexed signal, a second terminal supplied with an output signal of said second delay circuit which has been delayed by a total delay time of two horizontal scanning periods, and a third terminal supplied with an output signal of said first delay circuit which has been delayed by a delay time of one horizontal scanning period, said position detecting circuit controlling said switching circuit so as to selectively pass an input signal to said third terminal when said dropout detection signal is supplied to said switching circuit only through said first output terminal of said position detecting circuit, to selectively pass an input signal to said second terminal when said dropout detection signal is supplied to said switching circuit only through said second output terminal of said position detecting circuit, and to selectively pass an input signal to said first terminal when said dropout detection signal is not produced by said dropout detecting circuit.

4,628,370

APPARATUS FOR COPYING MAGNETIC TAPE

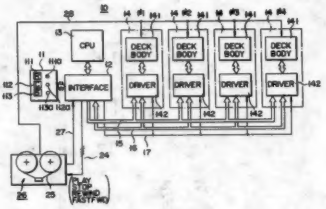
Norio Fukuoka, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,488

Claims priority, application Japan, Jun. 20, 1983, 58-110597; Jul. 27, 1983, 58-137329

Int. Cl.[4] G11B *5/86, 15/48*

U.S. Cl. 360—15 **4 Claims**



1. An apparatus for copying magnetic tape, comprising:

a slave deck having an operation panel and a plurality of copying units for receiving tapes to be copied;

a master deck means having a master tape and providing a reproduced output from the master tape to the tapes to be copied by the slave deck and producing start and finish signals corresponding respectively to the start and finish of the master tape's contents to be copied; and

control means coupled to said operation panel, to said slave deck and to said master deck, for selectively setting said copying units of the slave deck to a copying mode, a rewinding mode, or a stopping mode responsive to the setting of said operation panel, for setting of the master deck to a reproducing mode, rewinding mode, or stopping mode, and for causing rewinding of the tapes to be copied and the master tape to their initial state responsive to finish signals corresponding to the finish of the master tape's contents when the slave deck is set to the copying mode and the master deck is set to the reproducing mode;

wherein said control means comprises first means for detecting the state of the respective copying units, and second means for setting said copying units to the stopping mode responsive to detection of a defective copying unit by said detecting means, and for interrupting a following rewinding operation of the defective copying unit thereafter;

whereby operation of said operation panel and changing of tapes in said slave deck are carried out at said slave deck.

4,628,371

DROP-OUT COMPENSATOR FOR A RECORDED SIGNAL PLAYBACK SYSTEM

Kazuo Kuroda, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 562,522

Claims priority, application Japan, Dec. 25, 1982, 57-197673[U]

Int. Cl.[4] H04N *5/76*

U.S. Cl. 360—38.1 **2 Claims**

1. A drop-out compensator for a system for playing a recording medium carrying an RF signal having a component modulated by a main channel audio signal and a sub carrier signal modulated by a sub channel audio signal comprising:

an input means for receiving an RF signal read from said recording medium;

first demodulating means connected to said input means for demodulating said RF signal and producing a first demod-

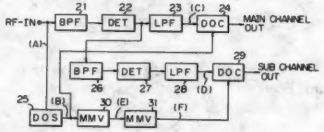
ulation signal including said main channel audio signal and said sub carrier signal;

a drop-out sensor connected for sensing one of a drop-out of said RF signal and a drop-out of said first demodulation signal and for producing a drop-out sensing signal;

first separating means connected to said first demodulating means for separating said main channel audio signal from said first demodulation signal, said separating means having a delay characteristic of a first delay time;

a first drop-out compensator connected to said first separating means, for compensating for a drop-out of said main channel audio signal in accordance with said drop-out sensing signal;

second demodulating means connected to said fist demodulating means for demodulating said first demodulation signal and producing a second demodulation signal including said sub channel audio signal;



second separating means connected to said second demodulating means for separating said sub channel audio signal from said second demodulation signal, said second separating means having a delay characteristic of a second delay time longer than said first delay time;

delay means responsive to said drop-out sensing signal, for producing an additional drop-out sensing signal by delaying the transmission of said drop-out sensing signal, said delay of transmission being substantially equal to the difference between said first delay time and said second delay time;

a second drop-out compensator connected to said second separating means, for compensating for a drop-out of said sub channel audio signal in accordance with said additional drop-out sensing signal.

4,628,372

METHOD AND APPARATUS FOR IDENTIFYING RECORDED INFORMATION SEGMENTS ON A RECORD MEDIUM

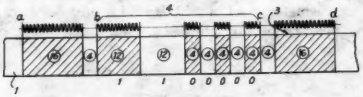
Takashi Morisawa, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 20, 1984, Ser. No. 632,963

Claims priority, application Japan, Jul. 21, 1983, 58-133226

Int. Cl.[4] G11B *5/09, 15/18*

U.S. Cl. 360—40 **20 Claims**



1. A method of recording address signals on a magnetic tape, for use in identifying respective program segments on said magnetic tape, in spaces arranged between the program segments, comprising the steps of:

providing a first burst signal having a first number of continuous sine waves of low frequency relative to the audio frequency band and a first blank signal having a length equal to said first burst signal, each representing the same one level of a binary signal;

providing a second burst signal having a second number of continuous sine waves of said low frequency, said second number being at least two times said first number, and a second blank signal having a length equal to said second burst signal, each representing the same other level of a binary signal;

arranging a plurality of said first burst signals and said first blank signals and said second burst signals and said second blank signals in a binary code pattern for each respective program segment, in which said step of arranging includes the step of assuring that a blank signal is always adjacent a burst signal in said binary code pattern; and

recording said binary code pattern in said space on said magnetic medium adjacent the respective program segment, whereby said respective program segment is identified by said binary code pattern recorded on said magnetic tape.

4,628,373

ROTATING HEAD TYPE MAGNETIC RECORD/REPRODUCE APPARATUS

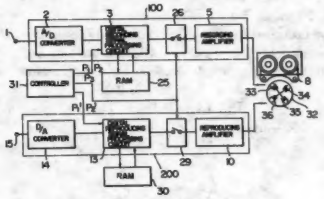
Hiroaki Takahashi; Shigeru Yamazaki; Takaharu Noguchi, and Takao Arai, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,554

Claims priority, application Japan, Jun. 10, 1983, 58-102606; Jun. 15, 1983, 58-105879

Int. Cl.[4] G11B *15/12, 5/00*

U.S. Cl. 360—62 **2 Claims**



1. A helical-scan type rotating head PCM record/reproduce apparatus comprising:

(a) PCM recording signal processing means having a convertor for converting an analog input signal to a digital signal, and digital signal processing means for adding an error detecting/correcting signal to said digital signal;

(b) record/reproduce means for recording an output signal from said PCM recording signal processing means on a magnetic tape in an oblique direction and reproducing said recorded output signal, said means having first and second record heads and first and second reproduce heads alternately disposed in the rotating direction;

(c) PCM reproducing signal processing means having a digital-signal processing circuit for performing error detection/correction process to the signal from said reproduce head, and a D/A converter for converting said processed signal to the original signal; said first record and reproduce heads and second record and reproduce heads of said record/reproduce means being disposed with a spacing of not more than 90°, and said record heads being displaced by a predetermined track width from said reproduce heads in the track width direction so that the same track is traced by said record and reproduce heads;

(d) storage devices coupled to said digital-signal processing circuits of said PCM recording signal and reproducing signal processing means so as to write the digital signals from said processing circuits and to read at different time from said writing time;

(e) record/reproduce change-over switch circuits provided on the lines for a signal to be recorded and for a reproduced signal of said PCM recording signal and reproducing signal processing means so as to turn on and off said signals, respectively; and

(f) control means coupled to said digital signal processing circuits and said switch circuits of said PCM recording

signal and reproducing signal processing means so as to compress, expand and on-off control the digital signals, said control means including a timebase-conversion control section coupled to said digital-signal processing circuits of said PCM recording signal and reproducing signal processing means so as to compress the timebases of the digital signals in said digital-signal processing circuits to within a head-rotation angle of 90°, and expand the timebases of said timebase compressed signals to a head-rotation angle of 180°, and a record/reproduce switching control section coupled to said switch circuits of said PCM recording signal and reproducing signal processing means so as to alternately turn on and off said switch circuits in association with said timebase compression and expansion time,

whereby said digital signal is recorded and reproduced alternately and intermittently.

4,628,374

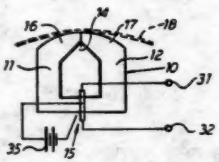
MAGNETIC RECORDING SYSTEM AND METHOD

Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 621,490, Jun. 18, 1984, abandoned, which is a continuation-in-part of Ser. No. 293,838, Aug. 18, 1981, Pat. No. 4,455,581. This application Jul. 29, 1985, Ser. No. 760,254

Int. Cl.[4] G11B *5/03, 5/127*

U.S. Cl. 360—66 **21 Claims**



1. A transducer system comprising:

a magnetic transducer head including a magnetic core having a coupling region at a record medium path for coupling of the transducer head with a channel of a magnetic record medium moving along said record medium path,

record medium drive means for moving a magnetic record medium along said record medium path during recording of a signal on a channel of the record medium, and

recording means comprising current conductor means coupling with said magnetic core for producing an effective recording field at said coupling region in accordance with a signal to be recorded, such that the signal is recorded along a channel of the record medium,

said recording means supplying an alternating polarity pulse electric current to said current conductor means with each successive pulse having alternately opposite polarity and with the pulses having a constant amplitude and having substantially a given pulse repetition rate with respect to pulses of the same polarity, and having a discontinuous pulse waveform with relatively short duration pulses of alternate polarity and with substantially zero amplitude intervals of relatively long duration between each pair of the successive pulses of alternate polarity,

said magnetic transducer head having an effective frequency response extending at least to the third harmonic of said pulse repetition rate but having a recording resolution so as to be incapable of recording effectively the fundamental frequency corresponding to said pulse repetition rate.

4,628,375

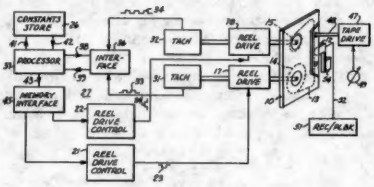
CONTROL SYSTEMS FOR MAGNETIC RECORDING TAPES

Wilfried Stadlmann, Butzbach, Fed. Rep. of Germany, assignor to Transamerica Delaval Inc., Lawrenceville, N.J.

Filed Jun. 28, 1985, Ser. No. 750,526

Int. Cl.[4] G11B *15/43*

U.S. Cl. 360—71 **20 Claims**



1. In a method of recording information with a magnetic recording head on a magnetic recording tape reeled from a first rotating tape coil into a second rotating tape coil, the improvement of assuring constant head-to-tape contact with constant tape tension independently of variations in coil diameter, comprising in combination steps of:

providing a first tape drive for the first tape coil;

providing a second tape drive for the second tape coil;

providing a first control signal for controlling the first tape drive;

providing a second control signal for controlling the second tape drive;

determining for a series of diameter ratios between the first and second tape coils a series of corresponding values of said first and second control signals for effecting advancement of the magnetic recording tape relative to the magnetic recording head with said first and second tape drives at constant head-to-tape contact with constant tape tension for all diameter ratios of said series;

providing first and second tachometer signals indicative of simultaneous rates of rotation of the first and second rotating tape coils;

providing in response to said first and second tachometers signals an electric third signal indicative of instantaneous diameter ratio between the first and second tape coils;

selecting for each diameter ratio of said series in response to said electric third signal those of said corresponding values of said first and second control signals effecting said advancement of the magnetic recording tape relative to the magnetic recording head at constant head-to-tape contact with constant tape tension at the particular diameter ratio; and

controlling said first and second tape drives with the latter first and second control signals having values selected for each diameter ratio of said series for advancement of the magnetic recording tape at constant head-to-tape contact with constant tape tension.

4,628,376

MAGNETIC DISC UNIT

Masahiro Kato, Chichibu, and Tetsu Ogawa, Hanazono, both of Japan, assignors to Canon Denshi Kabushiki Kaisha, Chichibu, Japan

Filed May 3, 1984, Ser. No. 607,399

Claims priority, application Japan, May 12, 1983, 58-81713; May 13, 1983, 58-82586

Int. Cl.[4] G11B *19/00*

U.S. Cl. 360—71 **16 Claims**

1. A magnetic disc unit comprising:

magnetic disc eject signal generating means for generating a magnetic disc eject signal for automatically ejecting a magnetic disc from said magnetic disc unit;

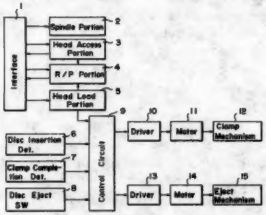
head load signal generating means for generating a head load signal for loading a magnetic head relative to said magnetic disc;

prohibition means responsive to said magnetic disc eject signal and said head load signal for inhibiting the generation of said magnetic disc eject signal; and

control means responsive to the output from said prohibition means for controlling the ejection of said magnetic disc from said magnetic disc unit.

14. A magnetic disc unit comprising:

a clamping member for clamping a magnetic disc;



a control member for controlling the clamping operation of said clamping member;

a motor for driving said clamping member via said control member to perform the clamp of said magnetic disc and to release the clamping of said magnetic disc;

a clamp releasing member for driving said clamping member via said control member to manually release the clamping of said magnetic disc; and

an ejecting member controlled by said control member driven to release the clamping of said magnetic disc by either of said motor and said clamp releasing member for ejecting the released magnetic disc.

4,628,377

INFORMATION SIGNAL REPRODUCING APPARATUS

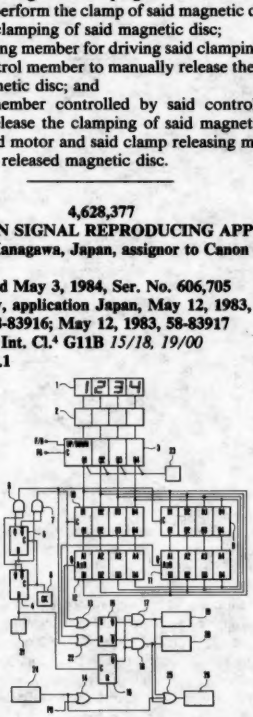
Isao Harigaya, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed May 3, 1984, Ser. No. 606,705

Claims priority, application Japan, May 12, 1983, 58-83915; May 12, 1983, 58-83916; May 12, 1983, 58-83917

Int. Cl.[4] G11B *15/18, 19/00*

U.S. Cl. 360—72.1 **36 Claims**



1. An information signal reproducing apparatus, comprising:

(a) reproducing means for reproducing information signals recorded on a recording medium;

(b) moving means for moving said recording medium relative to said reproducing means;

(c) manually operable means for indexing a first position and a second position on said recording medium; and

(d) control means for controlling at least the operation of said moving means so that those of the information signals which have been recorded in an area of the medium between said first and said second positions are repeatedly reproduced in either direction.

4,628,378

INFORMATION SIGNAL RECORDING AND/OR REPRODUCING APPARATUS

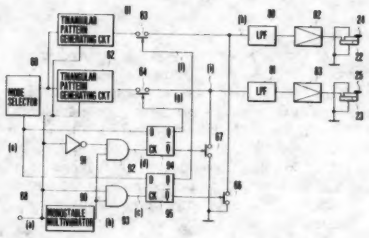
Nobutoshi Takayama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,806

Claims priority, application Japan, Aug. 26, 1983, 58-156688; Sep. 9, 1983, 58-167071

Int. Cl.[4] G11B *21/02*

U.S. Cl. 360—77 **16 Claims**



1. An information signal recording and/or reproducing apparatus for recording and/or reproducing the information signal on and/or from tracks on a recording medium; comprising:

(a) a pair of heads to trace the recording medium;

(b) a pair of shifting means for shifting said pair of heads, said heads being respectively mounted on said pair of shifting means;

(c) first driving means to generate first and second driving signals for driving said pair of respective shifting means, said first and second driving signals being respectively a signal for tracing said pair of heads along the tracks when the apparatus is in a first recording and/or reproducing mode;

(d) second driving means to generate third and fourth driving signals for driving said pair of shifting means respectively, said third and fourth driving signals being signals for tracing said pair of heads along the tracks when the apparatus is in a second recording and/or reproducing mode, a maximum value of level difference between the third and fourth driving signals obtained at the same time being smaller than a maximum value of level difference between the first and second driving signals obtained at the same time;

(e) mode selection means for switching between said first and second recording and/or reproducing modes; and

(f) driving control means for driving said pair of shifting means by selectively using said first, second, third and fourth driving signals to the same extent in the same direction in response to said mode selection means switching from the first mode to the second mode.

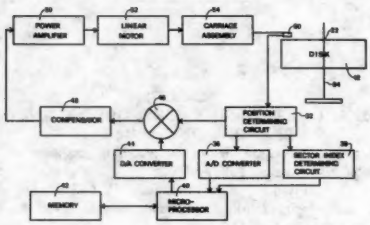
4,628,379

DISK RUNOUT COMPENSATOR

Thomas L. Andrews, Jr.; Thomas A. Fiers, and Richard G. Laatt, all of Longmont, Colo., assignors to Amcodyne Incorporated, Longmont, Colo.

Filed Sep. 25, 1984, Ser. No. 655,355
Int. Cl.[4] G11B *5/56*
U.S. Cl. 360—77 8 Claims

MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 7 Pages)



6. In a system for reducing runout associated with a rotating disk, an apparatus comprising:

means for gathering position information related to the runout;

means for reducing said position information to obtain discrete data associated with the runout;

means for determining a representation of the runout using said discrete data, said means for determining including means for determining a first sinusoidal component and for separately determining a second sinusoidal component, said first sinusoidal component having an amplitude and said second sinusoidal component having an amplitude, each of said amplitudes being separately obtained using said position information and said means for determining; and

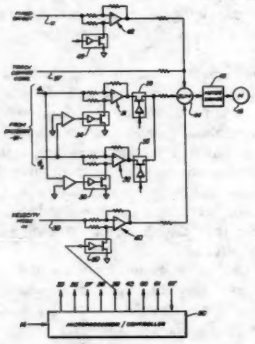
means for generating a signal substantially equal to the representation of the runout to compensate for the runout.

4,628,380

ENCODER OUTPUT PHASE SELECTION SYSTEM FOR MAGNETIC DISK MEMORY

James E. Quackenbush, Chatsworth, Calif., assignor to Computer Memories, Inc., Chatsworth, Calif.

Filed Apr. 17, 1985, Ser. No. 724,191
Int. Cl.[4] G11B *21/08*
U.S. Cl. 360—78 5 Claims



1. A system for selecting which encoder output phase is to be used for track servoing in a magnetic disk drive memory in which the position of the read/write head is indicated by an encoder having plural output phases, comprising:

a region of concentric control tracks on a disk of said memory situated adjacent to the data storage area of said disk, alternate ones of said control tracks containing a certain marker burst pattern,

first means for moving said head to the middle of said region of said control tracks using one of said encoder output phases,

second means for determining whether said marker burst pattern is detectable by said head at the position to which it was moved by said first means,

(a) and if so, for then offsetting said head in the radially inward and radially outward directions respectively by about one-third track spacing, and determining at each such position if the marker burst pattern is still detectable by said head,

(b) and if not, for thereafter repositioning said head utilizing other encoder output phases, until one such phase results in positioning of the head such that said marker burst pattern is detected at such position and at at least one other position offset by plus or minus approximately one-third track spacing therefrom, and

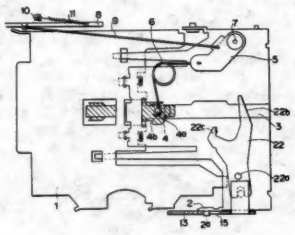
means for provisionally electing as the phase for subsequent track follow servoing that encoder phase which resulted in burst detection at the position reached using that encoder phase and at at least one other position plus or minus about one-third track spacing therefrom.

4,628,381

EJECTION MECHANISM FOR TAPE PLAYER

Kazuki Takai, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,159
Claims priority, application Japan, Mar. 31, 1983, 58-53992
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—93 7 Claims



1. An ejection mechanism for a tape player, comprising:

a pack guide into which a tape pack can be inserted in an insertion direction and means supporting said pack guide for movement in directions transverse to said insertion direction between an insertion position and a loaded position;

a pack stopper and means supporting said pack stopper for movement relative to said pack guide in directions approximately parallel to said insertion direction along a path of movement between first and second positions so that, when said pack guide and said pack stopper are respectively in said insertion and first positions, a tape pack inserted into said pack guide will engage said pack stopper and move it toward its second position, wherein as said pack stopper moves from its first position to its second position it passes through a third position located between said first and second positions;

a swing plate and means supporting said swing plate for rotation relative to said pack guide between a normal position and an eject position;

a movable, manually operable ejection lever and means operatively coupling said ejection lever to said swing plate for effecting movement of said swing plate between its normal and eject positions in response to movement of said ejection lever;

inversion means for yieldably urging said pack stopper toward said first position when said pack stopper is between said first and third positions and when said swing plate is in said normal position, for yieldably urging said pack stopper toward said second position when said pack stopper is between said second and third positions and when said swing plate is in said normal position, and for yieldably urging said pack stopper toward said first position when said swing plate is in said eject position, said inversion means including an inversion spring operatively connected to said pack stopper and to said swing plate;

an eject lock arm and means supporting said eject lock arm for pivotal movement relative to said pack guide so that a first end of said eject lock arm moves along the path of movement of said pack stopper in the region of said second position of said pack stopper, said first end of said eject lock arm being engageable with a side of said pack stopper facing in said insertion direction;

a movable lock plate operatively coupled to a second end of said eject lock remote from said first end for movement therewith, said lock plate being moved between a locking position and a release position in response to movement of said eject lock arm, wherein as said lock plate moves to its release position said first end of said eject lock arm moves in said insertion direction, said lock plate having means for releasably locking said pack guide in said insertion position when said lock plate is in said locking position and for permitting said pack guide to move freely between said insertion and loaded positions relative to said lock plate when said lock plate is in said release position;

a lock spring yieldably urging said lock plate toward said locking position; and

check means provided on said eject lock arm and engageable with said pack stopper for limiting movement of said pack stopper away from said second position in a direction opposite said insertion direction until said pack guide is in its insertion position and said lock plate is in its locking position.

4,628,382

CASSETTE LOADING DEVICE FOR VTR

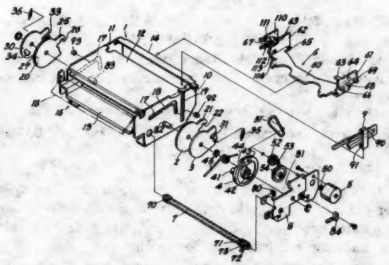
Yuuzi Okumura, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jul. 31, 1985, Ser. No. 760,794

Claims priority, application Japan, Dec. 20, 1984, 59-269847

Int. Cl.⁴ G11B *15/00*

U.S. Cl. 360—93 **7 Claims**



1. A cassette loading device comprising a cassette holder for holding a cassette inserted through a cassette inlet, transport means for moving the cassette from an insertion position to a completely loaded position by driving the cassette holder, and a reduction drive assembly for coupling the transport means to a drive source, the reduction drive assembly comprising a first drive mechanism having a small reduction ratio and disengageably in engagement with the transport means when the cassette holder is located between the insertion position and the completely loaded position, and a second drive mechanism having a great reduction ratio and disengageably engageable with the transport means when the cassette holder is brought to the completely loaded position or immediately therebefore.

4,628,383

TAPE CASSETTE LOADING DEVICE IN A MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

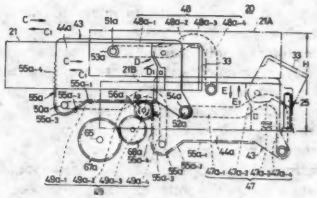
Ritsu Miyamoto, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 25, 1984, Ser. No. 573,874

Claims priority, application Japan, Jan. 28, 1983, 58-13071; Jan. 28, 1983, 58-13072; Feb. 22, 1983, 58-24479[U]; Mar. 1, 1983, 58-34127; Mar. 1, 1983, 58-30116[U]; Mar. 4, 1983, 58-31155[U]

Int. Cl.⁴ G11B *15/00, 5/008*

U.S. Cl. 360—96.5 **9 Claims**



1. A tape cassette loading device in a magnetic recording and/or reproducing apparatus, said recording and/or reproducing apparatus having a member which relatively enters within a tape cassette as the tape cassette is loaded into a predetermined loading position inside the recording and/or reproducing apparatus, said member being required to carry out recording and reproduction, said tape cassette loading device comprising:

a cassette holder for accommodating and holding the tape cassette which is inserted therein, said cassette holder being movable together with the inserted tape cassette between a cassette inserting position where the tape cassette is inserted and the predetermined loading position where said member relatively enters within the tape cassette;

guiding means for guiding said cassette holder so that said cassette holder undergoes in sequence a horizontal frontward movement of the cassette holder from the cassette inserting position, a subsequent obliquely upward movement of the cassette holder for avoiding the horizontal frontward movement from being interfered with by said member, and a subsequent downward movement of the cassette holder to the predetermined loading position, said horizontal frontward movement coinciding with the direction in which the tape cassette is inserted into the cassette holder;

driving means which starts to operate when the tape cassette is inserted into the cassette holder which is in the cassette inserting position; and

tape cassette loading means driven by said driving means, said tape cassette loading means moving said cassette holder under guidance of said guiding means to the predetermined loading position together with the tape cassette which is accommodated within the cassette holder.

4,628,384

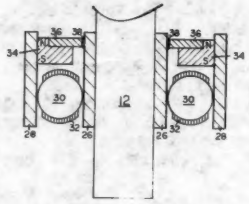
BEARING ASSEMBLY WITH INTEGRATED FERROFLUID SEAL

Kuldip Raj, Merrimack, and Raoul Casciari, Bedford, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Continuation-in-part of Ser. No. 526,781, Aug. 26, 1983, which is a continuation-in-part of Ser. No. 450,339, Dec. 16, 1982, Pat. No. 4,407,508. This application Jan. 9, 1984, Ser. No. 569,189

Int. Cl.[4] G11B 5/012

U.S. Cl. 360—97 15 Claims



1. A bearing assembly with an integrated ferrofluid seal, which bearing assembly comprises:

(a) a bearing assembly adapted to surround a rotatable shaft and having an inner race and a spaced-apart outer race to define a raceway therebetween, and roller elements in the raceway and cage means to retain the roller elements in the raceway, to provide for the rotation of the inner and outer races relative to one another; and

(b) a ferrofluid seal apparatus in the raceway and generally closely adjacent the roller elements of the bearing assembly, which ferrofluid seal apparatus comprises

(i) a single magnetic pole piece having a one and another end, the one end radially extending into a close, noncontacting relationship with a surface of the inner or outer race to define a small radial gap,

(ii) an annular axially-polarized permanent magnet having a radially disposed one end and another end relative to the axis of said shaft, the permanent magnet having a generally L-shaped cross-sectional configuration, the one end of the permanent magnet extending toward said radial gap to form an air gap with the said surface, said other end of said pole piece being in contact with the permanent magnet between arms of the L-shaped configuration, the permanent magnet having a permeability which is not much greater than the magnetic permeability of air and acting as a magnetic insulating housing about the other end of the pole piece, and

(iii) ferrofluid retained in the radial gap by the magnetic flux from the permanent magnet, to provide a ferrofluid exclusion seal with said surface, the magnetic flux circuit passing between the pole piece, the ferrofluid in the radial gap, said surface, the air gap, and the permanent magnet.

12. A computer-disk-drive system which comprises in combination:

(a) the bearing assembly of claim 1;

(b) a rotatable disk-drive-spindle shaft extending through the bearing assembly and secured to the inner race;

(c) a memory-reading head in a protected environment;

(d) a computer disk on the shaft and read by the reading head in the environment;

(e) means to rotate the shaft; and

(f) the ferrofluid seal having a radial gap formed with the inner surface of the inner race or the inner surface of the outer race positioned between the protected environment and the bearing assembly.

4,628,385

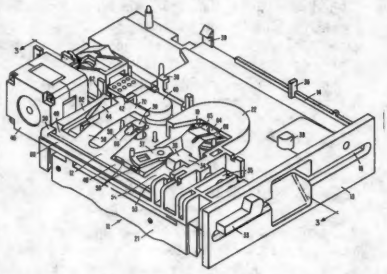
TWO STAGE COLLETING IN A FLEXIBLE DISK DRIVE

Donovan M. Janssen; Alan J. Kirton, both of Boulder; Robert M. Murphy, Longmont, and Leroy Rose, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 6, 1984, Ser. No. 628,633

Int. Cl.[4] G11B 5/016, 17/02

U.S. Cl. 360—99 6 Claims



1. In a flexible disk drive having a frame for receiving a cartridge with a flexible disk therein, with said cartridge and said flexible disk each having a central aperture therein, apparatus for precisely centering and clamping the flexible disk to the spindle of the disk drive, said apparatus comprising:

a collet shaft extending from said frame, said shaft having a first portion adjacent to said frame and having a second portion outwardly from said first portion with the diameter of said second portion being less than that of said first portion;

a collet slidably mounted on said collet shaft, said collet being substantially constrained from lateral movement while adjacent to said first portion of said collet shaft; and

actuating means for causing said collet to be moved from a first position adjacent to the first portion of said collet shaft to a second position adjacent to the second portion of said collet shaft, said collet penetrating the central aperture of said flexible disk and engaging said spindle for centering and clamping said flexible disk to the spindle during said movement of said collet from said first position to said second position, and said collet being moveable laterally with respect to the axis of said spindle while adjacent to said second portion of said collet shaft to thereby precisely center said disk with respect to said spindle axis.

4,628,386

MAGNETIC READING AND/OR WRITING HEAD SUPPORT ASSEMBLY

Jacques Chabrolle, Bagnolet, France, assignor to LCC.CICE-Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed Feb. 24, 1983, Ser. No. 469,457

Claims priority, application France, Feb. 26, 1982, 82 03260

Int. Cl.[4] G11B 5/48, 21/20

U.S. Cl. 360—104 5 Claims

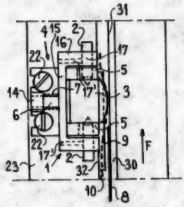
1. In a magnetic reading and/or writing device having a guide for guiding a magnetic data carrier in a first direction, and a magnetic head for reading and/or writing data on said carrier, a magnetic head support comprising:

a mobile stirrup piece positioned adjacent said guide with said data carrier positionable therebetween;

pivot means fixed to said stirrup piece and pivotally supporting said head for rotation only about an axis parallel to said first direction;

a fixed piece fixed adjacent said guide;

means associated with said fixed piece for supporting and guiding said stirrup piece only for movement in a linear second direction transverse to said first direction, wherein said fixed piece has two grooves extending in said second direction and in which said pivot means are engaged, said



grooves forming a portion of said supporting and guiding means for said mobile stirrup piece; and

means for biasing said stirrup piece towards said guide, whereby said carrier is pressed against said head and said guide.

4,628,387

READ/WRITE AND TRIM ERASE MAGNETIC HEAD ASSEMBLY

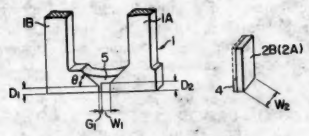
Shinji Furuichi, Kumagaya, Japan, assignor to Hitachi Metals, Inc., Tokyo, Japan

Filed Feb. 8, 1983, Ser. No. 464,858

Claims priority, application Japan, Feb. 10, 1982, 57-19900

Int. Cl.[4] G11B *5/265, 5/325*

U.S. Cl. 360—121 **6 Claims**



1. A read/write and trim erase magnetic head assembly comprising:

a read/write magnetic head having a read/write magnetic core including a projecting portion establishing a read/write gap, said projecting portion having a predetermined height measured in the direction perpendicular to said read/write gap;

a plurality of eraser magnetic heads abutting said read/write magnetic head, each of said eraser magnetic heads having a respective eraser magnetic core; and

a plurality of non-magnetic predetermined thickness respectively disposed individually between said read/write magnetic head and each of said eraser magnetic heads,

each of said eraser magnetic heads having an eraser gap of a width defined by the thickness of the respective non-magnetic member and a depth defined by said projecting portion height of said read/write magnetic core.

4,628,388

HEAD CLEANING APPARATUS

Hirokazu Kawabe, Tokyo, Japan, assignor to Kabushiki Kaisha Nagaoka, Japan

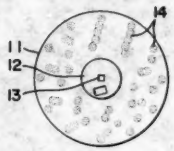
Filed Jun. 7, 1985, Ser. No. 742,409

Claims priority, application Japan, Nov. 27, 1984, 59-249967

Int. Cl.[4] G11B *23/03;* A47L *1/00*

U.S. Cl. 360—128 **8 Claims**

1. A head cleaning apparatus comprising: a case formed to the same shape and dimension of a hard case of hard-cased floppy disks; and a cleaning sheet rotatably installed in the case, the cleaning sheet formed to the same shape and dimension of the magnetic disk of a floppy disk, the cleaning sheet



having microcapsules containing cleaning liquid attached on both sides of the sheet.

4,628,389

LOCK MEMBER FOR THE LID OF A MAGNETIC TAPE CASSETTE

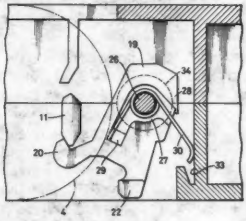
Kimio Tanaka, Saku; Haruo Shiba, Komoro, and Yoshiya Sakata, Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,337

Claims priority, application Japan, Sep. 13, 1983, 58-140910; Sep. 13, 1983, 58-140911

Int. Cl.[4] G11B *23/04;* G03B *1/04*

U.S. Cl. 360—132 **3 Claims**



1. A magnetic tape cassette comprising:

a cassette housing having a front opening;

a lid pivotally connected to the front of the housing to open and close the front opening;

a lock member having a pivot for pivotally mounting the lock member on one front side portion of the housing and the lock member being lockingly engageable with and disengageable from an inner surface of the lid;

the lock member having a recess surrounding the pivot with a lateral side opening and a rear side opening, the lateral side opening being parallel to the front side portion of the housing, the rear side opening being opposite the front of the housing; and

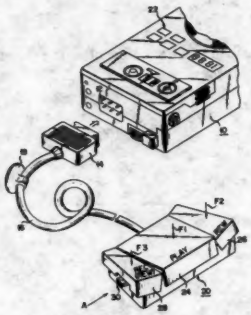
a lock-member-biasing spring accommodated in the recess, a first end of the spring extending rearwardly through the rear side opening of the recess and engaging the housing, the lock-member-biasing spring biasing the member into locking engagement with the inner surface of the lid.

4,628,390

FOOT SWITCH APPARATUS FOR A TRANSCRIBER

Kazuyasu Motoyama, and Katsumi Kanayama, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 322,230, Nov. 17, 1981, abandoned.
This application Feb. 24, 1984, Ser. No. 582,150
Claims priority, application Japan, Nov. 26, 1980, 55-169363[U]
Int. Cl.[4] G11B *19/08, 19/00*
U.S. Cl. 360—137 7 Claims



4. A foot switch apparatus for an electronically controlled tape recorder which does not per se include an automatic back space operation mode, the tape recorder being provided with a mode control circuit having control input terminals for at least playback, stop and rewind operation modes of the tape recorder, and mode selection switches coupled to the control input terminals for selecting each of the playback, stop and rewind operation modes; said foot switch apparatus being external to the tape recorder and comprising:

switch means adapted to be coupled to the playback operation mode control input terminal and the stop operation mode control input terminal of the mode control circuit, and responsive to pressure selectively applied by a foot switch operator, for switching to the playback operation mode control input terminal a playback signal when said pressure is applied, and for switching to the stop operation mode control input terminal a stop signal after said pressure is removed;

back spacing means coupled to said switch means and adapted to be coupled to the rewind operation mode control input terminal of the mode control circuit, for generating a back spacing signal for a given period of time after said pressure is removed, so that the tape recorder performs a rewind operation according to said back spacing signal during said given period of time, and for preventing actuation of the stop mode of the tape recorder during said given period of time; and

prohibiting means adapted to be coupled to the playback operation mode control input terminal of the mode control circuit and coupled to said back spacing means, for prohibiting operation of said back spacing means from generating said back spacing signal while the mode selection switches on the tape recorder are set to select the playback operation mode;

wherein said prohibiting means includes:

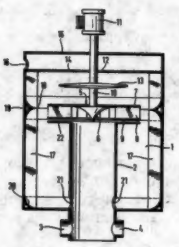
diode means arranged to be connected between the playback operation mode control input terminal of the mode control circuit and a node in said back spacing means, for allowing a voltage potential to develop at said node to produce said back spacing signal when said switch means of the foot switch apparatus is used for switching of said playback signal, and for preventing said voltage potential from developing when the mode selection switches of the tape recorder are operated to select the playback operation mode.

4,628,391

METHOD FOR DISPERSING TWO PHASES IN LIQUID-LIQUID EXTRACTION

Bror G. Nyman, Vanha-Ulvila; Stig-Erik Hultholm, Pori; Launo L. Lilja, Pori, and Valto J. Mäkitalo, Pori, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed May 14, 1984, Ser. No. 609,737
Claims priority, application Finland, May 12, 1983, 831657
Int. Cl.[4] B01F *3/08, 5/10*
U.S. Cl. 366—265 3 Claims



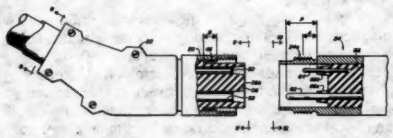
1. A process, for mixing a light liquid phase and a heavy liquid phase in liquid-liquid extraction with each other to produce a good dispersion, comprising maintaining the light phase continuous and dispersing in the heavy phase in the light phase, said continuous light phase having a volume smaller than or at most equal to the volume of the dispersed heavy phase, by causing a substantially vertical circulation flow to take place in the dispersing volume, and including initiating said circulation flow in the said light phase; and wherein the dispersion is circulated in the dispersion volume through several cycles before it is removed from the dispersion volume and the circulating time of the dispersion is shorter than the separating time of the solution phases in the dispersion.

4,628,392

EXPLOSION PROOF ELECTRICAL CONNECTOR SYSTEM WITH QUICK POWER DISCONNECT

Robert G. Didier, Santa Rosa, Calif., assignor to BIW Cable Systems, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 563,503, Dec. 20, 1983. This application May 15, 1984, Ser. No. 610,595
Int. Cl.[4] H02H *7/00*
U.S. Cl. 361—2 3 Claims



1. An explosion-proof electrical connector system that couples first and second connector members carrying main electrical power conductors in a fluid environment that can include combustible gases comprising:

a set of power contacts that electrically connect said power conductors between said connector members, said power contacts having first and second members mounted on said first and second connector members, respectively, and being axially movable with respect to one another over an axial distance P between a fully withdrawn position where the electrical connection is broken and a fully inserted position where there is an electrical connection between said power contacts,

a circuit breaker connected to said main conductors,

means for operating said circuit breaker when said connectors are uncoupled and separated axially,

said operating means including a set of auxiliary contacts each having first and second members mounted in said first and second connector members, respectively, and being axially movable with respect to one another over an axial distance A between a withdrawn position where the electrical connection between said first and second auxiliary contact members is broken and a fully inserted position where there is an electrical connection between said auxiliary contact members, said distance P being greater than said distance A, and

an annular, resilient, insulating lip seal secured at one fixed end to said first connector and having a free end of smaller diameter than and surrounding a portion of said second connector in a radially stretched condition, said lip seal being disposed to block leaking of fluid between said lip seal and said connector portion and isolate the interior of said connectors adjacent said contacts from fluid external to said connectors.

4,628,393

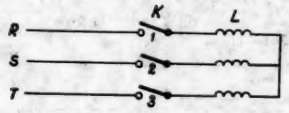
METHOD FOR SWITCHING IN A THREE-PHASE HIGH VOLTAGE CIRCUIT

Bertus Griesen, Hengelo, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Continuation of Ser. No. 239,050, Feb. 27, 1981, abandoned. This application Mar. 11, 1982, Ser. No. 357,131

Int. Cl.⁴ H02H *3/033*

U.S. Cl. 361—3 **2 Claims**



1. A method for interrupting power to an inductive load supplied from a three-phase high voltage source to prevent virtual chopping and using a vacuum switch having quick dielectric recovery characteristics in each phase of the high voltage network, comprising the steps of:

opening the vacuum switch in a first phase at a given time; and

opening at least one of the two remaining vacuum switches at a time subsequent to said given time equal to or greater than at least one-third of the period of the three-phase high voltage network frequency plus the minimum arcing time of the vacuum switch in the said first phase wherein the time of opening said at least one of the two remaining vacuum switches subsequent to said given time is less than one cycle of the power frequency.

4,628,394

VOLTAGE SURGE SUPPRESSOR

John J. Crosby, and John J. Napiorkowski, both of Cape Elizabeth, Me., assignors to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 629,288, Jul. 9, 1984, Pat. No. 4,584,622. This application Sep. 27, 1984, Ser. No. 655,126

The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.

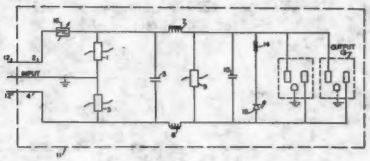
Int. Cl.⁴ H02H *9/04*

U.S. Cl. 361—56 **3 Claims**

1. A voltage surge suppressor for AC power lines comprising: a circuit, an RFI/EMI filter, a semiconductor voltage limiting device and an output to which electronic equipment can be connected;

said circuit comprising an input consisting of a line, a neutral and a ground; a first varistor connected between the line and ground; a second varistor connected between the neutral and ground;

said RFI/EMI filter comprising a first capacitor in parallel with the two varistors; a first choke connected in series with the line after the first varistor and first capacitor; a



second choke connected in series with the neutral after the second varistor and first capacitor; said semiconductor voltage limiting device being a third varistor connected between the line and neutral after the two chokes; and a second capacitor in parallel with said third varistor.

4,628,395

OVERLOAD PROTECTING CIRCUIT FOR AN INVERTER DEVICE

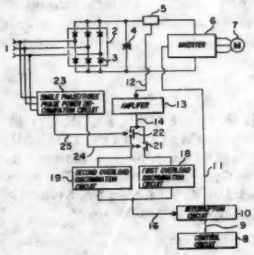
Eiichi Sugishima, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,988

Claims priority, application Japan, Nov. 21, 1983, 58-219003; Jan. 13, 1984, 59-4431

Int. Cl.⁴ H02H *3/26*

U.S. Cl. 361—18 **3 Claims**

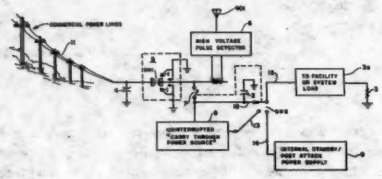


1. An overcurrent protecting circuit protecting an inverter device which converts an alternating current from an a.c. power source into a direct current by a converter, the direct current resulted by said converter means smoothed by a smoothing capacitor, said smoothed direct current being subjected to inversion by an inverter to be an alternating current which is used for driving an alternating current load, including a power discrimination means for discriminating whether an input power is single phase or three phase and an overcurrent level changing means for reducing a level of overcurrent to protect said inverter from damage caused by overcurrent, said overcurrent level changing means being connected to said power discrimination means.

4,628,396
HIGH VOLTAGE DISCONNECT/RECONNECT SWITCHING DEVICE

D. Frank E. Flemming, East Spanaway, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 16, 1984, Ser. No. 672,239
Int. Cl.[4] H02H *3/20*
U.S. Cl. 361—91 5 Claims



1. A high-voltage power switch arrangement for use with a power source with power supplied via feed lines comprising:

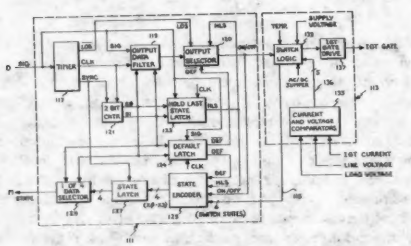
primary contacts including a fixed contact and a moving contact located within an enclosure having a vacuum or other special nonconducing environment, said contacts being normally closed to connect a power source to a load, probe means located within said enclosure positioned at a probe dielectric distance approximately equal to the normal source voltage, which is slightly behind the moving contact, the probe means being connected to ground, the moving contact having an open rest position in which it is connected to ground, a high-voltage pulse detector for detecting abnormal high-voltage components, actuator means electrically coupled to the high-voltage pulse detector and mechanically coupled to the moving contact;

operative in response to the detection of a high-voltage component by the high-voltage pulse detector to operate the actuator means to move the moving contact from the closed position to the open rest position, with the probe means providing a ground path for the extremely high electrical energy component, induced onto said feed lines, and greater than the source voltage, throughout the transition of the moving contact to the open rest position, where it is grounded, this being an open full isolate position.

4,628,397
PROTECTED INPUT/OUTPUT CIRCUITRY FOR A PROGRAMMABLE CONTROLLER

Ronald E. Gareis, and Mark J. Kocher, both of Charlottesville, Va., assignors to General Electric Co., Charlottesville, Va.

Filed Jun. 4, 1984, Ser. No. 617,095
Int. Cl.[4] H02H *3/093*
U.S. Cl. 361—98 17 Claims



1. Overcurrent protected input/output control circuitry for use in an input/output (I/O) system of a programmable controller, comprising:

control means for controlling load current to a connected load, said control means being responsive to a command signal to be turned on and off and including a main current section for carrying a major portion of said load current and a shunt current section for carrying a fractional portion of said load current;

current sensing means responsive to said fractional portion of the load current for provision of a signal indicative of load current;

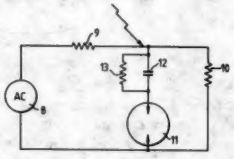
first reference means for providing a first reference signal, said first reference signal being indicative of an intermediate level of load current; and

first comparator means, including timing means, for receiving said load current indicative signal and said intermediate reference signal and operative to initiate said command signal for causing said control means to turn off the load current at a time which depends on (i) the time duration that said load current indicative signal exceeds said intermediate reference signal, and (ii) the magnitude of said load current indicative signal.

4,628,398
SURGE VOLTAGE PROTECTION ARRANGEMENTS

Kenneth G. Cook, Middlesex, England, assignor to The M-O Valve Company Limited, England

Continuation of Ser. No. 351,468, Feb. 23, 1982, abandoned.
This application Jun. 1, 1984, Ser. No. 616,173
Claims priority, application United Kingdom, Mar. 2, 1981, 8106562
Int. Cl.[4] H02H *9/04*
U.S. Cl. 361—120 8 Claims



1. A circuit arrangement comprising: a load, which is connected across a periodic A.C. supply, and a surge voltage protection arrangement for the load, said surge voltage protection arrangement comprising a gas-filled excess voltage arrester, a capacitance connected in series across the load and a resistance connected in parallel with the capacitance; the arrester constituting the sole voltage arrester of the surge voltage arrangement and starting to conduct at a voltage greater than that at which it will extinguish; and the capacitance having a value such that, with the arrester conducting and the A.C. supply voltage applied across the load, the capacitance charges substantially to the instantaneous value of the supply voltage, thereby extinguishing the arrester in a fraction of the A.C. supply period.

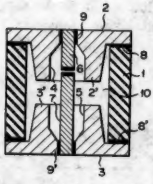
4,628,399
ANTI-OVERVOLTAGE PROTECTOR

Daizo Shigemori, Sagamihara, and Yuji Muramatsu, Tokyo, both of Japan, assignors to Kabushiki Kaisha Sankosha, Tokyo, Japan

Filed Mar. 27, 1985, Ser. No. 716,879
Int. Cl.[4] H02H *9/04*; H01T *2/02*
U.S. Cl. 361—120 14 Claims

1. An anti-overvoltage protector comprising a hollow cylindrical member formed of insulating material, a pair of main electrodes which are each formed of an electrically conductive material having a thermal coefficient of expansion greater than

that of said hollow cylindrical member and which are hermetically mounted, by fusion of metal having a low melting point, onto both end openings, of said hollow cylindrical member and which have their main discharge surfaces opposed, in said hollow cylindrical member, to each other with a gap interposed therebetween, a recess portion which is formed in said main discharge surface of at least one of said pair of main electrodes, and a pair of trigger electrodes which are conductively connected to said pair of main electrodes respectively and which are opposed, in said recess portion, to each other to



form a trigger discharge gap, whereby the dimension of said trigger discharge gap is given as the dimension of said gap between said trigger electrodes which is produced due to the difference in the thermal coefficients of expansion between said pair of main electrodes and said hollow cylindrical member when said trigger electrodes are allowed to contact each other by zeroing the gap therebetween and, in this state, said pair of main electrodes are hermetically mounted, by fusion of metal having a low melting point, onto both end openings of said hollow cylindrical member and, thereafter, the resultant unit is cooled down to room temperature.

4,628,400

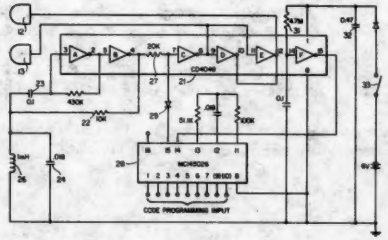
ELECTRONIC KEYED LOCK

Eugene Y. Ho, San Carlos, Calif., assignor to Techne Electronics Ltd., Palo Alto, Calif.

Continuation of Ser. No. 576,812, Feb. 3, 1984, abandoned. This application Mar. 4, 1986, Ser. No. 837,568

Int. Cl.[4] H01H *47/28*

U.S. Cl. 361—172 **4 Claims**



1. An electronic keyed lock comprising a key including an oscillator operated to provide signals at a predetermined frequency outside the range of FCC licensing frequencies, means including an encoder for receiving said oscillator signals and providing programmed pulses of energy having said predetermined frequency means for applying power to said key and means for delaying the provision of programmed pulses for a predetermined time, a lock, means for coupling said programmed predetermined frequency pulses to said lock, means for receiving said programmed pulses of energy and forming output programmed pulses and a decoder pre-programmed with said pulse program for receiving said output pulses and providing an output signal when the output programmed pulses twice match the pre-programmed pulse program in said decoder.

4,628,401

ELECTRIC FEED DEVICE WHICH CAN BE STARTED BY A LIQUID

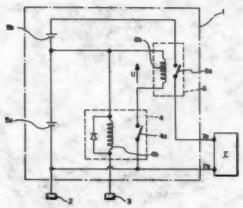
James B. Parlant, Touvre; Michel Etourneau, Ruelle, and Christian C. Bled, Equeurdreville, all of France, assignors to Etat Francais, Paris, France

Filed Nov. 20, 1984, Ser. No. 673,513

Claims priority, application France, Nov. 22, 1983, 83 18538

Int. Cl.[4] H01H *47/22*

U.S. Cl. 361—178 **10 Claims**



1. An electric device which can be started by immersion in a liquid, comprising:

a first circuit comprising, in series, two electrodes, a first voltage source and a first relay coil controlling a first relay switch;

a second circuit comprising, in series, said first voltage source, a second voltage source, a second relay switch controlled by a second relay coil, and use terminals for connection to an external load, the voltage across said use terminals being substantially equal to the sum of the voltages across said first and second voltage sources; and

said first relay switch and said second relay coil being connected in series to a voltage source selected from the group consisting of said first voltage source, said second voltage source and a third voltage source.

4,628,402

LIGHTNING PROTECTION OF FASTENERS IN COMPOSITE MATERIAL

James H. Covey, Snohomish, assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1985, Ser. No. 782,226

Int. Cl.[4] H05F *1/02*

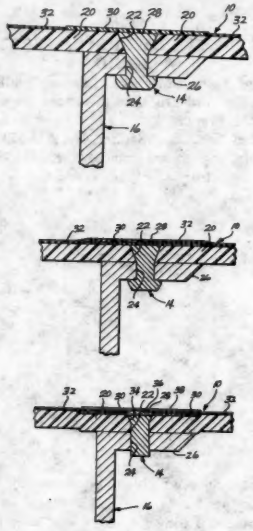
U.S. Cl. 361—218 **7 Claims**

1. For a lightning accessible skin member made of a composite material and having a relatively low electrical conductivity, said skin member being attached to another member by a fastener having a relatively high electrical conductivity, said fastener extending through a bore in said skin member and having a head portion positioned in substantially flush relationship with the other surface of said skin member, a system for diverting a lightning strike away from said fastener, comprising:

a conductive layer of material on the outer surface of said skin member, said conductive layer extending across said surface to at least within a certain preselected distance from and about said fastener's head portion, to define a border region on said skin member's outer surface having a relatively low conductivity which surrounds said head portion; and

a layer of dielectric material covering said head portion and said border region, said dielectric layer extending away

from said head portion across said border region, wherein the edge of said dielectric layer is in meeting relationship



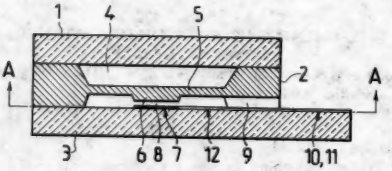
with the edge of said conductive layer, to divert a lightning strike from said fastener and to said conductive layer.

4,628,403

CAPACITIVE DETECTOR FOR ABSOLUTE PRESSURE

Heikki T. Kuisma, Helsinki, Finland, assignor to Vaisala Oy, Helsinki, Finland

Filed Feb. 15, 1985, Ser. No. 701,857
Claims priority, application Finland, Feb. 21, 1984, 840699
Int. Cl.[4] G01L *9/12*; H01G *5/16*
U.S. Cl. 361—283 **8 Claims**



1. A capacitive detector for the measurement of the absolute pressure of a medium, which comprises:

a first insulating plate functioning as a base;

a stationary capacitor plate attached onto said first insulating plate;

a silicon plate attached onto said first insulating plate and having a thin, membrane-like middle portion functioning as a mobile capacitor plate and defining a chamber between itself and said first insulating plate, and a channel allowing free entrance of the medium into said chamber;

a second insultating plate attached hermetically onto said silicon plate so as to define an aneroid capsule between itself and said membrane-like middle portion, the distance of said membrane-like middle portion from said stationary capacitor plate being a function of the absolute pressure to be measured;

a first terminal arranged outside said silicon plate in conductive contact therewith, and

a second terminal arranged outside said silicon plate; and

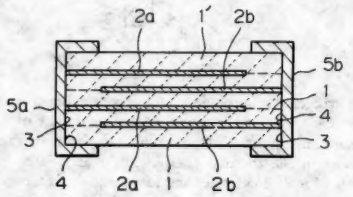
a conductor electrically connecting said second terminal with said stationary capacitor plate through said channel.

4,628,404

DIELECTRIC COMPOSITION AND LAMINATED CAPACITOR

Nobuo Yokoe; Takashi Okawa; Nobuyoshi Fujikawa, and Kazuyoshi Yamashita, all of Kokubu, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Jan. 9, 1986, Ser. No. 817,517
Int. Cl.[4] H01G *4/10*; C04B *35/46*
U.S. Cl. 361—321 **5 Claims**



3. A multilayer ceramic capacitor comprising

(a) a laminated monolithic structure obtained by preparing a plurality of units each consisting of a thin layer of a dielectric ceramic composition and a thin layer of a metal paste formed as an internal electrode on the surface of the ceramic layer so that it reaches one end of the ceramic layer but does not reach the other end, stacking the units so that the metal pastereaching ends of the ceramic layers and the other ends are each alternately situated on the same side, pressbonding them, and sintering the entire assembly, and

(b) external electrodes provided on both sides of the laminated structure;

wherein

said dielectric ceramic composition is a dielectric ceramic composition prepared by adding 0.1 to 1.3% by weight of B_2O_3, 1.0 to 3.0% by weight of SiO_2 and 0.5 to 3.0% by weight of ZnO to a major proportion of a composition comprising 18.0 to 27.0% by weight of $BaTiO_3$, 31.6 to 36.3% by weight of Nd_2O_3, 27.6 to 35.5% of TiO_2, 2.5 to 8.1% by weight of Bi_2O_3 and 5.6 to 9.0% by weight of Pb_3O_4, and

the internal electrode is made of a silver-palladium alloy in which silver is present in a major amount.

4,628,405

INTEGRATED CIRCUIT PRECISION CAPACITOR

John A. Lippert, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 19, 1985, Ser. No. 766,474
Int. Cl.[4] H01G *4/10, 7/00*
U.S. Cl. 361—321 **6 Claims**

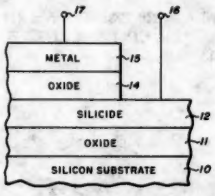
1. A capacitor suitable for fabrication on a monolithic silicon integrated circuit, said capacitor having a very low voltage coefficient of capacitance and comprising:

a first plate composed of a material selected from the group consisting of refractory metals and refractory metal silicides;

a dielectric layer located on said first plate, said dielectric layer being characterized as having a very low incidence

of interface trapping states where it contacts the first plate;

a second plate located on top of said dielectric layer; and



means for making electrical connnections to said first and second plates.

4,628,406

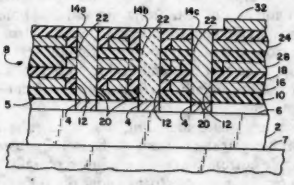
METHOD OF PACKAGING INTEGRATED CIRCUIT CHIPS, AND INTEGRATED CIRCUIT PACKAGE

Kenneth R. Smith, Aloha; Kent H. Johnston; George S. LaRue, both of Beaverton; Robert A. Mueller, Portland, all of Oreg., and Steven A. Tabor, Aptos, Calif., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 20, 1985, Ser. No. 736,205

Int. Cl.[4] H05K *1/11*

U.S. Cl. 361—386 **8 Claims**



1. A method of packaging at least two integrated circuit chips each having an interconnect face and a back face and also having a plurality of contact pads arranged in one or more first patterns on its interconnect face, the methed comprising providing an elastic sheet-form interconnect member that has at least two main face areas and comprises dielectric material and conductor runs supported by said dielectric material in mutually electrically-insulated relationship and having termination points arranged in at least two second patterns at said main face areas respectively and corresponding with said first patterns respectively, placing said interconnect face of each chip in mutually confronting relationship with the main face area at which is arranged the pattern of termination points that corresponds with the pattern of contact pads of the chip, bringing the pattern of contact pads of the chip and the corresponding pattern of termination points of the interconnect member into mutually registering relationship, so as to form an assembly of the interconnect member and the integrated circuit chips wherein electrically conductive contact is established between said pads and said termination points, and forming a metallurgical bond between each contact pad and the corresponding termination point of the interconnect member.

4,628,407

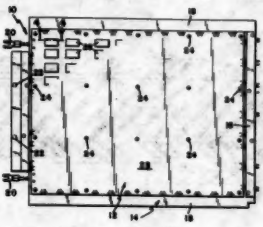
CIRCUIT MODULE WITH ENHANCED HEAT TRANSFER AND DISTRIBUTION

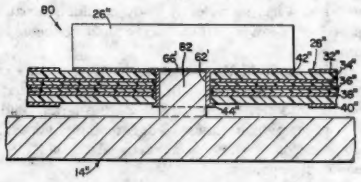
Melvin C. August, and John T. Williams, both of Chippewa Falls, Wis., assignors to Cray Research, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 487,516, Apr. 22, 1983, Pat. No. 4,535,385. This application Apr. 17, 1984, Ser. No. 599,688

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—388 **8 Claims**





1. A circuit module with enhanced heat transfer and distribution characteristics, comprising:

a circuit board having top and bottom sides, and conductive signal plane and ground plane layers;

a plurality of electronic devices mounted on the top side of said circuit board, each electronic device being located over at least one through-hole extending between the top and bottom sides of said circuit board;

a cooling plate extending adjacent to the bottom side of said circuit board;

means mechanically interconnecting said circuit board and said cooling plate in predetermined minimal spaced-apart relationship; and

a first thermally-conductive pad engaged between each electronic device and the top side of said circuit board;

said cooling plate including a plurality of integral extensions extending through the through-holes in said circuit board into engagement with said electronic devices, said extensions being isolated from the signal plane layers but connected to the ground plane layer of said circuit board so as to distribute heat from said electronic devices across said board while conducting heat through said board for transfer to said cooling plate.

4,628,408

INPUT DEVICE

Kiyoshi Kimura, Aza-Fujigasaki, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 3, 1985, Ser. No. 771,889

Claims priority, application Japan, Sep. 3, 1984, 59-132668[U]

Int. Cl.[4] H01H *9/08*

U.S. Cl. 361—395 **3 Claims**

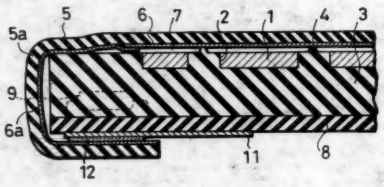
1. An input device comprising:

(a) a lower electrode of an electrically conductive material and having a plurality of apertures therein;

(b) a resilient insulating base superimposed on said lower electrode and having a plurality of integral dot spacers projecting through said apertures, said resilient insulating base having recessed spaces;

(c) an upper flexible insulating sheet disposed in confronting relation to said insulating base with said dot spacers interposed therebetween, said upper flexible insulating sheet supporting an upper electrode on one surface thereof;

(d) a printed-circuit board disposed below said insulating base;



(e) a plurality of diodes mounted on said printed-circuit board and accommodated in said spaces, said printed-circuit board having an electrically conductive pattern disposed on a lower surface thereof and connected to said diodes; and

(f) said upper insulating sheet having extensions extending around sides of said insulating base and said printed-circuit board onto the lower surface of the latter, said upper electrode having terminal leads extending over said extensions and connected by a heat seal to said electrically conductive pattern.

4,628,409

PRINTED CIRCUIT BOARDS

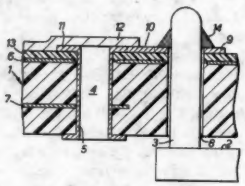
Gordon L. Thompson, Cheadle; Brian Gudgeon, Rossendale, and Kenneth J. Wombwell, Stockport, all of Great Britain, assignors to International Computers Limited, London, England

Continuation of Ser. No. 636,618, Aug. 1, 1984, abandoned. This application Feb. 14, 1986, Ser. No. 829,239

Claims priority, application United Kingdom, Aug. 20, 1983, 8322473

Int. Cl.[4] H05K *1/18*

U.S. Cl. 361—403 **3 Claims**



1. A multilayer printed circuit board including a plurality of internal conductive layers comprising conductive tracks; a plurality of unplated holes extending through the circuit board; a plurality of plated through-holes extending through the circuit board and being connected to selected ones of said conductive tracks of different layers; a surface pad of conductive material adjacent each unplated hole at a first face of the circuit board; surface conductors on said first face connecting at least some of the surface pads directly to plated through holes; at least one component having connection pins, each pin extending into an unplated hole and being soldered to its adjacent surface pad; and a layer of solder resist material extending over the plated through-holes at said first face.

4,628,410

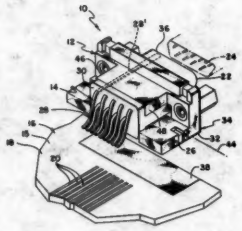
SURFACE MOUNTING CONNECTOR

David S. Goodman, Mission Viejo, and Leland W. Oliver, Santa Ana, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Apr. 10, 1985, Ser. No. 721,748

Int. Cl.[4] H01R *23/72*

U.S. Cl. 361—413 **12 Claims**



1. A surface mounting connector for mounting on a circuit board that includes a row of conductive contact traces and a ground trace comprising:

a connector housing assembly having a substantially flat solderable bottom metal surface area which can rest stably on the board and which can be soldered to the ground trace; and a row of contacts, each having a main contact portion lying within said housing assembly at a location above said bottom surface area and fixed to said housing assembly, each contact having an elongated and bendable tail extending from said main contact portion and at a downward incline away from said housing assembly to rest on and be soldered to one of the contact traces when the housing assembly rests stably on the board;

said housing assembly including a housing formed of insulative material and having a rear end from which said tails extend and an opposite front end and said housing assembly also including a grounding plate with a front part lying on the front end of said housing, said contacts having front ends opposite said tails and said front part of said grounding plate substantially surrounding said front end of said contacts; and

said grounding plate including a solderable metal bottom portion lying at the bottom of the housing assembly, said solderable bottom portion including a plurality of recesses which receive solder to form solder fillets therein, to resist movement of the housing assembly parallel to the face of the circuit board.

4,628,411

APPARATUS FOR DIRECTLY POWERING A MULTI-CHIP MODULE FROM A POWER DISTRIBUTION BUS

Demetrios Balderes, Wappingers Falls; Andrew J. Frankovsky, Endwell, and Robert A. Jarvela, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 588,610, Mar. 12, 1984, abandoned. This application May 2, 1985, Ser. No. 729,831

Int. Cl.[4] H05K *5/00*

U.S. Cl. 361—414 **5 Claims**

1. A system for providing a signal current and a power current to an integrated circuit chip, comprising:

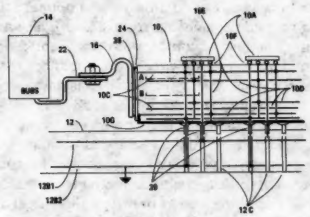
a substrate;

at least one integrated circuit chip mounted on a top of said substrate;

electrical conductor means disposed within said substrate and connected to said integrated circuit chip and conducting an electric power current from an edge of said substrate to said integrated circuit chip and from said inte-

grated circuit chip to said edge of said substrate, said electrical conductor means including a plurality of electrically conductive metalization layer means, each said metalization layer means including a body portion and a plurality of projections connected to said body portion and protruding therefrom, said integrated circuit chip being electrically connected to said metalization layer means;

tab means connected to one of said projections of one of said metalization layer means of said electrical conductor means at said edge of said substrate and conducting said electric power current directly from a power source to



said integrated circuit chip via the one projection of the one metalization layer mean of said electrical conductor means; and

input/output pin means disposed on a bottom of said substrate and connected to said integrated circuit chip via said electrical conductor means for conducting an electric signal current to and from said chip via said electrical conductor means, said input/output pin means conducting said electric signal current to or from said integrated circuit chip, the projections of said metalization layer means conducting said electric power current to or from said integrated circuit chip.

4,628,412

CASE FOR SHIELDING ELECTRONIC DEVICES

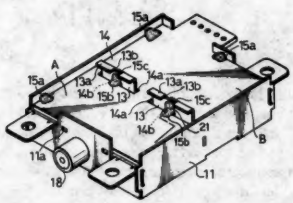
Shigeru Nigorikawa, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Dec. 12, 1984, Ser. No. 680,934

Claims priority, application Japan, Dec. 12, 1983, 58-191330[U]

Int. Cl.⁴ H05K 9/00

U.S. Cl. 361—424 **5 Claims**



1. A case housing an electronic device including a printed circuit board, comprising:

a metal frame having an opening on one side;

a metal cover covering said opening;

said circuit board being fixedly mounted in said frame spaced apart from said cover and having at least a hole defined therein;

a shield plate portion extending through said hole toward an inner surface of said cover and having a distal end thereof provided with a contact leg bent and held in contact against the inner surface of said cover;

said distal end further defining a recess adjacent said contact leg extending to one side of said shield plate portion, said circuit board including a projecting tongue defining a part of said hole extending proximate said one side of said shield plate portion in alignment with said recess;

whereby a solder connection can be readily formed between said projecting tongue and said one side of said shield plate portion in alignment with said recess, said recess allowing for solder not to be placed between said contact leg and said inner surface of said cover.

4,628,413

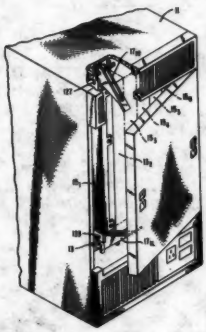
CARD CASSETTE EJECTOR APPARATUS

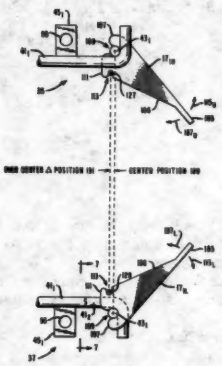
Floyd G. Speraw, Lexington, S.C., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 18, 1985, Ser. No. 810,157

Int. Cl.⁴ H05K 7/16

U.S. Cl. 361—415 **5 Claims**





1. An apparatus comprising:

a plurality of card cassettes, each of said card cassettes including upper and lower portions;

a housing for selectively receiving said plurality of cassettes; and

a plurality of pairs of first and second levers coupled to said housing for respective engagement with said plurality of card cassettes, said first and second levels of a given pair of said first and second levers being respectively rotatable in a first set of directions to respectively engage said upper and lower portions of an associated care cassette to force said associated card cassette into said housing and being respectively rotatable in a second set direction to respectively engage said upper and lower portions of said associ-

ated card cassette to pull said associated card cassette from said housing;

said housing including upper and lower racks, said upper rack including a plurality of parallel upper wires and a first crosswire, said lower rack including a plurality of parallel lower wires and a second crosswire, wherein associated pairs of upper and lower wires form a channel for each of said card cassettes;

each of said upper and lower portions of each of said card cassettes including a pin; and

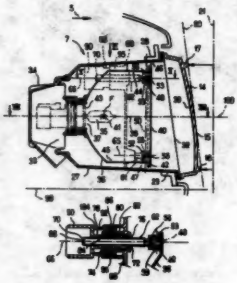
each of said first and second levers in a given pair of levers having an opening to enable said lever to be snapped over an associated one of said first and second crosswires, a detent for receiving an associated said pin, and a handle for rotating each said lever in an associated direction to force said associated pin to move horizontally to move an associated card cassette into or out of its associated channel.

4,628,414

METHOD OF MANUFACTURING AND OF ADJUSTING THE ORIENTATION OF A MOTOR VEHICLE HEADLAMP; AND A MOTOR VEHICLE HEADLAMP FOR PERFORMING SAID METHOD

Jacques Ricard, Paris, France, assignor to Cibie Projecteurs, France

Filed Jun. 27, 1985, Ser. No. 749,308
Claims priority, application France, Jul. 2, 1984, 84 10465
Int. Cl.[4] B60Q *1/06*; F16B *37/00*
U.S. Cl. 362—61 **5 Claims**



1. A method of adjusting the orientation of a motor vehicle headlamp of the type comprising a transparent glass fixed to bodywork of a vehicle wherein the following steps are performed to place the headlamp's optical axis in a first predetermined orientation relative to a plane which is fixed relative to said vehicle;

(1) providing a headlamp comprising:

transparent glass adapted to be fixed to a vehicle;

an optical assembly having an optical axis adapted to pass through said glass;

means defining a plane which is fixed relative to said glass and which, when said glass is fixedly mounted to said vehicle bodywork, occupies an orientation which at least approximately coincides with a second predetermined orientation relative to said plane which is fixed relative to said vehicle; and

means for connecting said optical assembly to said glass comprising both guide pivot means for guiding said optical assembly to pivot relative to said glass about a pivot axis which, when mounted, is at least approximately parallel to said plane which is fixed relative to said vehicle; and

graduated adjustment means for adjusting the position of said optical assembly relative to said glass by pivoting about said pivot axis;

(2) positioning a reference plane relative to said headlamp, said reference plane being fixed relative to said glass in such a manner that said plane which is fixed relative to said glass occupies said second predetermined orientation relative to said reference plane and that said pivot axis is at least approximately parallel to said reference plane, then acting on said graduated adjustment means to pivot said optical assembly relative to said glass about said pivot axis until said optical axis occupies said first predetermined orientation relative to said reference plane, and setting the graduation of said graduated adjustment means to have an origin corresponding to said relative position and to indicate the angular orientation of said optical axis relative to said reference plane and from said origin; and

mounting said headlamp on said vehicle and fixing said glass to said vehicle bodywork in such manner that said plane which is fixed relative to said glass is positioned as close as possible to said second predetermined orientation; and

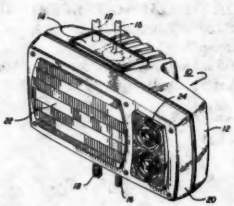
(3) measuring such angular offset as there may be between the mounted orientation and said second predetermined orientation and pivoting said optical axis through an angle as marked by said graduation equal to said measured offset and in such direction as to bring said optical axis into said first predetermined orientation.

4,628,415

AUTOMOTIVE LAMP

Donald W. Vescio, Fulton, and Harry T. Travers, Syracuse, both of N.Y., assignors to R. E. Dietz Company, Syracuse, N.Y.

Filed Jan. 10, 1986, Ser. No. 817,557
Int. Cl.[4] F21V *3/00*
U.S. Cl. 362—61 **8 Claims**



1. A vehicular lamp assembly comprising a housing; at least one twin-element bulb lamp of the bayonet type having two lamp elements and a cylindrical metal base serving as a common return electrode for said elements and a pair of conductive end pins each connected to a respective one of said elements; and a lampholder in which said at least one lamp is mounted within said housing, said lampholder including

a conductive bulb retainer plate having formed therein means for holding said base and maintaining electrical contact with the same, a pair of conductive resilient contact strips parallel with one another and disposed in parallel relation with and spaced from said bulb retainer plate; a lampholder body of non-conductive rigid material and including means mounting said bulb retainer plate and mounting said contact strips for at least limited flexing motion towards and away from said retainer plate; and resilient means, mounted on said lampholder body and behind said contact strips at the location of the end pins of said lamp, for urging said contact strips into contact with the associated end pins.

4,628,416

VARIABLE SPOT SIZE ILLUMINATOR WITH CONSTANT CONVERGENCE ANGLE

David A. Dewey, Huntington Beach, Calif., assignor to CooperVision, Inc., Menlo Park, Calif.

Filed May 3, 1985, Ser. No. 729,983
Int. Cl.[4] F21V *7/04*; A61B *17/36*
U.S. Cl. 362—32 **12 Claims**

1. A variable spot size illuminator for projecting a variable size spot of light into an illumination plane comprising

a source of light,

fiberoptic image transmission means having an entrance surface and an exit surface,

means for projecting a cone of said light onto said entrance surface,

objective lens means for focusing light emerging from said exit surface into an illumination plane, and

means for varying the distance between said entrance surface and the vertex of said cone of light.

11. A laser photocoagulator having a variable spot size with substantially constant beam convergence angle for use with a slit lamp comprising

laser source of light,

flexible optical fiber means having an entrance end which receives light form said laser and an exit end from which said received light emerges,

fiberoptic image transmission means having an entrance surface and an exit surface,

means for projecting a cone of said light onto said entrance surface,

objective lens means for focusing light emerging from said exit surface into an illumination plane, and

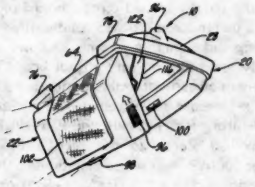
means for varying the distance between said entrance surface and the vertex of said cone of light.

4,628,417

COMBINATION DOME/CARGO LAMP

Les K. Kaminski, and Michael E. Dyke, both of Sterling Heights, Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 9, 1985, Ser. No. 806,912
Int. Cl.[4] B60Q *3/06*
U.S. Cl. 362—74 **9 Claims**



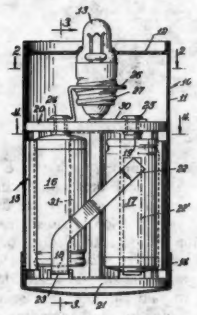
1. A combination dome/cargo lamp for a pickup truck including a cargo box and a cab having a rear window permitting viewing of the cargo box, the dome/cargo lamp comprising an outer casing having an upper portion securable to the ceiling of the cab adjacent to the rear window, the outer casing having a lower portion, an inner casing, pivot means connecting the inner casing to the lower portion of the outer casing, an electric bulb in the inner casing, a lens on the inner casing covering the bulb to direct light outwardly of the inner casing, the inner casing being pivotable by hand into the outer casing where the lens will direct light into the cab thereby functioning as a dome lamp and pivotable by hand downwardly away from the outer casing to a position where the lens will direct light through the rear window into the cargo box thereby functioning as a cargo lamp, the outer casing having an opening therethrough adjacent to the pivot means, a cover extending from the inner casing through the opening, electrical wire means extending from the upper portion of the outer casing through the opening and between the inner casing and the cover into operative connection with the bulb, the cover traveling through the opening during pivoting of the inner casing and at all times isolating the electrical wire means from an operative hand.

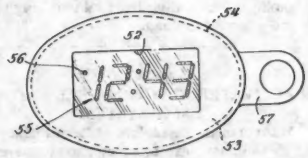
4,628,418

MULTI-PURPOSE MINIATURE FLASHLIGHT DEVICE

Paul R. Chabria, West Chicago, Ill., assignor to Press-A-Lite Corporation, West Chicago, Ill.

Filed Feb. 14, 1986, Ser. No. 829,314
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—116 **16 Claims**





1. A multi-purpose miniature pocket flashlight comprising

a cartridge having top and bottom end wall means, capable of being accommodated within a flexible casing, and having means for holding a pair of batteries between said top and bottom end wall means;

the top end wall means including metal contacts extending therethrough to be in communication with each battery;

one said contact communicating with a bracket, the bracket extending upwardly from the top end wall, said other contact communicating with a metallic connector strip;

a lamp removably mounted to said bracket and having a bottom center contact thereof in communication with the metallic connector strip;

spring switch arm means electrically communicating with the positive terminal of one said battery, whereby upon squeezing the flexible casing, the spring switch arm means is capable of completing electrical continuity with the negative terminal of the other said battery whereby to illuminate the light;

a flexible casing accommodating said cartridge therein, said flexible casing having a top cap and a bottom cap, said top

cap having an aperture for the lamp to project outwardly therethrough in order to illuminate the surrounding area, one of said caps being removable whereby to grant access to the interior of the casing and permit the removal of the cartridge, lamp, batteries, and spring arm, as a unit therefrom; and,

mounting magnet means arranged between said cartridge and said flexible case whereby to permit said miniature flashlight to be magnetically mounted to metallic surfaces.

4,628,419

SIGNAL LAMP

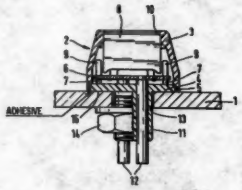
Willi Schmid, Fislisbach, Switzerland, assignor to W. Schmid AG, Fislisbach, Switzerland

Filed Aug. 8, 1984, Ser. No. 638,887

Claims priority, application Switzerland, Aug. 9, 1983, 4322/83

Int. Cl.[4] F21V *3/00*

U.S. Cl. 362—145 **11 Claims**



1. The combination of a support, such as a control panel, having a front side, with a signal lamp comprising a housing including a front portion having an aperture disposed in a predetermined plane, a rear portion, a substantially flat rear side located in the region of said rear portion and disposed in front of said support, and a carrier which is at least substantially parallel to said plane and to said rear side, means for securing said housing to said support, said securing means being disposed in the region of, and including an adhesive coating on, said rear side, a light emitting diode mounted on said carrier behind said aperture and confined in said housing substantially in its entirety, and conductor means connected with said diode and extending from said housing through said rear side and adhesive coating.

4,628,420

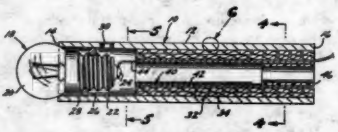
WATER ACTIVATED ELECTRIC CELL AND SURVIVAL LAMP SYSTEM

David T. McArthur, deceased, late of Lake Elsinore, Calif., by Donald E. Guilliams, executor, assignor to Beverly Safford, Yucaipa, Calif.

Filed Sep. 30, 1983, Ser. No. 537,818

Int. Cl.[4] F21L *7/00*

U.S. Cl. 362—208 **16 Claims**



1. A survival lamp which comprises a hermetically sealed, generally cylindrical container having top and bottom walls, light bulb means mounted on said top wall and having an illuminating portion exposed to radiate light above said top wall, and a water-activated, deferred action electric cell supported within said container, said cell having an upper terminal portion electrically connected to said light bulb means and an open lower end portion to admit activating water therein, said bottom wall having a tear-out section constituting a major portion of the lower end portion which is adapted to be torn out so as to open the hermatically sealed container and freely admit water through said bottom wall,

wherein said cell further comprises first and second electrodes having spaced, opposed, surface portions, and porous water-absorbent electrical insulation material impregnated with dried water-soluble electrolyte material disposed between and in contact with said surface portions, a portion of said insulation material being exposed from between said surface portions for application of aqueous fluid thereto activate the cell;

said first electrode being composed principally of magnesium and having an electrically conductive, corrosion-inhibiting coating composed principally of detergent covering at least said surface portion thereof.

4,628,421

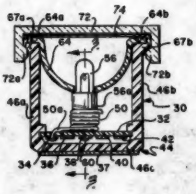
STRIP LIGHTING

Lawrence E. Saar, 810 Second Ave., Bensenville, Ill. 60106

Filed Jan. 23, 1986, Ser. No. 821,784

Int. Cl.[4] F21V *19/06*

U.S. Cl. 362—238 **16 Claims**



1. A strip lighting arrangement comprising:

an elongated, generally flat circuit board having a plurality of spaced conductive strips aligned along the length thereof;

an elongated housing having a slot-like aperture along the length thereof and adapted to receive said circuit board within and along the length thereof;

a plurality of lamps, each lamp including a first terminal forming a threaded lateral base portion of said lamp and a second terminal positioned on the bottom of said lateral base portion of said lamp;

a plurality of mounting means positioned on and aligned along the length of said circuit board in spaced relation and coupled in circuit to said conductive strips thereon for receiving and engaging a respective one of said lamps for securely mounting on said circuit board and electrically coupling in circuit with said conductive strips each of said lamps, wherein each of said mounting means includes a helical spring for engaging and electrically coupling the first terminal lateral base portion of a respective lamp to a first conductive strip while maintaining the second terminal bottom portion of the lamp in electrical contact with a second conductive strip;

a concave reflector positioned over the aperture of said housing and extending substantially along the length thereof, said reflector having a plurality of spaced apertures along the length thereof, wherein each aperture is adapted to receive a respective lamp therein; and

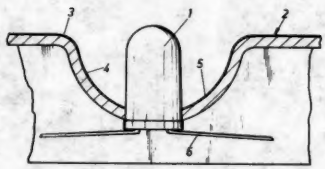
a light transmitting cover positioned over said reflector and along the length of the aperture in said elongated housing, wherein said cover securely engages said housing adjacent to the aperture therein in a snap-acting manner.

4,628,422

DISPLAY COMPRISING LIGHT-EMITTING DIODES AND A METHOD AND AN INSTALLATION FOR ITS MANUFACTURE

Rolf V. T. Ewald, Eldsberga, Sweden, assignor to Integrerad Teknik HB, Sweden

Continuation-in-part of Ser. No. 463,540, Feb. 3, 1983, abandoned. This application May 22, 1984, Ser. No. 613,091
Claims priority, application Sweden, Feb. 16, 1982, 8200913
Int. Cl.[4] F21V *1/00*
U.S. Cl. 362—240 2 Claims



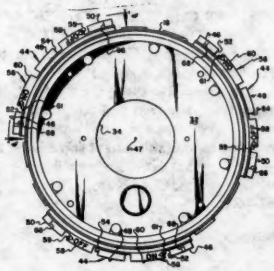
1. An improved display comprising light-emitting diodes, a plate for mounting said light-emitting diodes, dish-shaped reflectors formed in said plate, the improvement comprising openings formed in said plate, the diodes mounted in said openings with the diode walls arranged in tightly abutting relationship against edges of said openings to form a mechanical bond between said diodes and said plates, said diodes having a cross-sectional dimension increasing toward a rear portion to ensure that said diodes are securely wedged to said plate when mounted therein and adhesive furher strengthening said mechanical bond; connections in the form of rods, said rods interconnecting said diodes and extending parallel and spaced some distance from said plate of the display; a filler compound, said diode connections covered by said filler compound.

4,628,423

TWIST ON REFLECTOR FOR INDUSTRIAL LIGHT FIXTURE

William D. Ogle, Syracuse, N.Y., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 20, 1985, Ser. No. 778,592
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—341 16 Claims



1. In a light fixture including a housing for supporting a lamp socket and the like, means associated with said housing forming a generally cylindrical rim and including spaced apart radially extending projections forming groove means;

a lamp reflector adapted to be mounted on said housing and including a flange portion having radially extending projections cooperable with said projections on said means associated with said housing in such a way that said reflector may be supported on said housing by aligning said projections on said reflector in a predetermined position relative to said projections on said means associated with said housing and rotating said reflector to move said projections on said reflector into said groove means; and

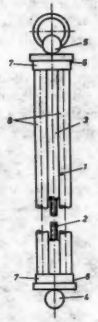
means cooperable with said projections on said reflector for locking said reflector in said groove means and against unwanted movement relative to said housing.

4,628,424

CHANDELIER

Friedhelm Bakalowits, 17, Halirschgasse, A-1170 Vienna, Austria

Filed Dec. 28, 1984, Ser. No. 687,151
Claims priority, application Austria, Dec. 28, 1983, 4547/83
Int. Cl.[4] F21V *11/00*
U.S. Cl. 362—351 10 Claims



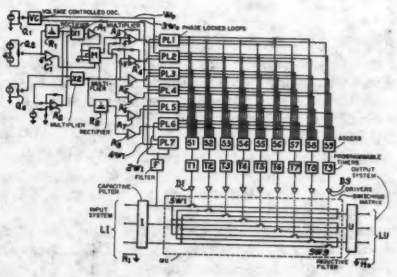
1. A chandelier hanging comprising a non-transparent supporting bar with a reflecting surface and at least one outer bar extending parallel to the supporting bar and consisting of translucent and substantially transparent material.

4,628,425

METHOD AND APPAPRATUS FOR THE CONVERSION OF A POLYPHASE VOLTAGE SYSTEM

Marco Venturini, Via S. Scorza 15/21, Genova, and Alberto Alesina, Via Marazzani 12, Milano, both of Italy

Filed Nov. 26, 1984, Ser. No. 674,929
Claims priority, application Italy, Dec. 5, 1983, 24008 A/83
Int. Cl.[4] H02M *5/22*
U.S. Cl. 363—10 3 Claims



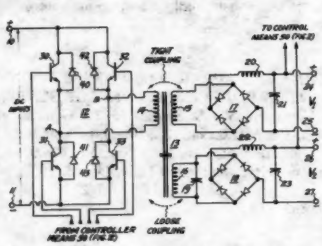
1. A direct AC converter including input phase conductors and a neutral conductor for a balanced polyphase AC input voltage system, a plurality of output phase conductors and a neutral conductor for a polyphase AC output voltage system having at least one characteristic such as frequency, amplitude,

phase angle or phase displacement between voltage and current which is different from that of the input voltage system, the input and output neutral conductors being unconnected between them, a plurality of electronic switch means for individually connecting each input phase conductor to each output phase conductor, means for generating control signals to cyclically operate said electronic switch means at a repetition rate substantially higher than the frequency of both the input and the output voltage systems, in a way to connect to each output phase conductor respectively only one input phase conductor at a time, and to connect all said input phase conductors to each one output phase conductor a plurality of times during any cycle of said input system or of said output system adjusting the switch means connection times in such a way that all the output phase voltages as measured with respect to the input neutral conductor comprise a common term which is a linear combination of two sinusoidal waveforms, the first one having a frequency equal to the input frequency multiplied by the number of phase conductors of the input system, and the second one having a frequency equal to the output frequency multiplied by the number of phase conductors of the output system, whereby the amplitude of the voltage as measured between any two of the output phase conductors is rendered maximum while at the same time each output voltage as measured between any output phase conductor and the input neutral conductor does not exceed at any time the amplitude of the input voltage at said time as measured between any input phase conductor and the input neutral conductor.

4,628,426
DUAL OUTPUT DC-DC CONVERTER WITH INDEPENDENTLY CONTROLLABLE OUTPUT VOLTAGES

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,430
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—17 **9 Claims**



1. A DC-DC converter comprising:

a transformer having a primary winding, a tightly-coupled secondary winding having substantially no leakage inductance, and a loosely-coupled secondary winding having a predetermined leakage inductance;

DC to AC conversion means connected to said primary winding and adapted to be connected to a DC supply, said DC to AC conversion means for supplying a variable frequency, variable duty cycle AC signal to said primary winding;

first rectifying means coupled to said tightly-coupled secondary winding for providing a first DC output voltage;

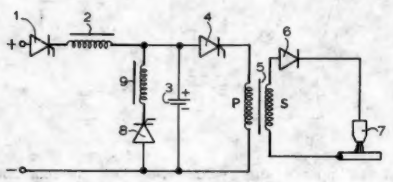
second rectifying means coupled to said loosely-coupled secondary winding for providing a second DC output voltage; and

controller means coupled to said first and said second rectifying means and to said DC to AC conversion means for adjusting the duty cycle of said AC signal to regulate said first DC output voltage in response to a first voltage command and for adjusting the frequency of said AC signal to regulate said second DC output voltage in response to a second voltage command.

4,628,427
D.C. IMPULSE ARC WELDER EMPLOYING THYRISTORS

Ivan K. Marvakov, and Todor Y. Russev, both of Sofia, Bulgaria, assignors to ZNIKA, Sofia, Bulgaria

Continuation of Ser. No. 493,004, May 9, 1983, abandoned. This application Jun. 7, 1985, Ser. No. 743,262
Int. Cl.[4] H03K *3/53*; B23K *9/10*
U.S. Cl. 363—27 **4 Claims**



1. In an apparatus for producing an impulse welding current, comprising a source of direct current having a constant voltage, a first thyristor connected to one of the poles of said current supply source, a closed series loop which comprise a capacitor, a second thyristor, and the primary winding of an impulse transformer, the second winding of the impulse transformer being adapted to be connected through a diode to a welding arc,

the improvement wherein a third thyristor is connected in parallel to the capacitor, and

between the first thyristor and the common point of the capacitor and the second thyristor there is connected a first choke,

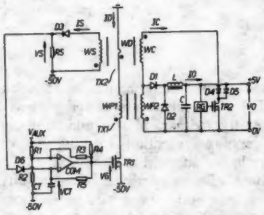
a second choke is connected in series with the third thyristor and the common point of the capacitor, the second thyristor and the first choke, and

the common point of the primary winding of the impulse transformer and the capacitor is connected to the other pole of the constant voltage current supply source.

4,628,428
MODULATION CIRCUIT FOR DC-DC CONVERTER WITH R-C OSCILLATOR

John D. Walker, Coventry, England, assignor to The General Electric Company, p.l.c., England

Filed Nov. 14, 1984, Ser. No. 671,451
Claims priority, application United Kingdom, Dec. 23, 1983, 8334373
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **4 Claims**



1. A DC-DC converter in which the primary winding of a

sense transformer is in series with the primary winding of a power transformer and a power switch, in which the on-off ratio of the power switch is directly controlled by a rectangular pulse output of a resistance-capacitance oscillator, in which the duration of and the time between pulses in said pulse output respectively correspond to the times taken for a capacitor within the oscillator to charge to and to discharge to respective first and second voltage reference values, in which the sense current in a secondary winding of the sense transformer is used to develop a unipolar sense voltage during each on-period of the power switch, in which said sense voltage is applied to the capacitor such that the time taken for the capacitor to charge to the first reference voltage value and hence the duration of the on-period of the power switch is variable dependent on the sense current during each said on-period, the time taken for the capacitor to discharge to the second reference voltage value being constant, in which said unipolar sense voltage which is applied to the capacitor is applied to one input of a comparator within the oscillator, in which a fixed reference voltage is applied to the other input of the comparator whereby the end of each said on-period is responsive to the output of the comparator which is galvanically connected to the power switch, in which the rising current in the primary winding of the sense transformer during each said on-period is dependent on the d.c. output current of the converter whereby current regulation of the converter output is provided via said sense current, in which a further winding of the sense transformer and a rectifier are connected in a series path which is in parallel with a secondary winding of the power transformer such that said further winding carries a unipolar current which is of constant amplitude during each said on-period and is switched synchronously with the current in the primary winding of the sense transformer, in which error signal means are provided to derive a voltage error signal from the d.c. output voltage of the converter, in which control means to which the voltage error signal is applied are provided in said series path including said further winding so that the constant amplitude of the current in said further winding during each on-period of the power switch is determined by the voltage error signal, and in which the amplitude of the rising said sense current during each said on-period is determined by the additive effect of the constant current in said further winding and the rising current in the primary winding of the sense transformer whereby voltage regulation of the converter output is also provided via said sense current.

4,628,429

DC-DC CONVERTER WITH GALVANICALLY ISOLATED FEEDBACK VOLTAGE REGULATION

John D. Walker, Coventry, England, assignor to The General Electric Company, p.l.c., England

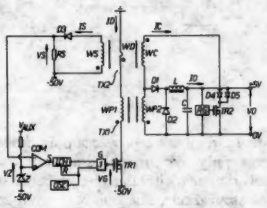
Filed Nov. 14, 1984, Ser. No. 671,239

Claims priority, application United Kingdom, Dec. 23, 1983, 8334372

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.[4] H02M 3/335

U.S. Cl. 363—21 **4 Claims**



1. A DC-DC converter in which a primary winding of a sense transformer is in series with a primary winding of a power transformer and a power switch

(a) in which a rising sense current in a secondary winding of the sene transformer during each on-period of the power switch develops a unipolar sense voltage which is applied by galvanic connection of the sense winding to one input of a comparator, a fixed reference voltage being applied to the other input of the comparator whereby the end of each said on-period is responsive to the output of the comparator which is galvanically connected to the power switch,

(b) in which the rising current in the primary winding of the sense transformer during each said on-period is dependent on the d.c. output current of the converter whereby current regulation of the converter output is provided via said sense current,

(c) in which a further winding of the sense transformer and a rectifier are connected in a series path which is in parallel with a secondary winding of the power transformer such that said further winding carries a unipolar current which is of substantially constant amplitude during each said on-period and is switched synchronously with the current in the primary winding of the sense transformer,

(d) in which error signal means are provided to derive a voltage error signal from the d.c. output voltage of the converter, in which control means to which the voltage error signal is applied are provided in said series path including said further winding so that the constant amplitude of the current in said further winding during each on-period of the power switch is determined by the voltage error signal,

(e) and in which the amplitude of said rising sense current during each said on-period is determined by the additive effect of the constant current in said further winding and the rising current in the primary winding of the sense transformer, whereby voltage regulation of the converter output is also provided via said sense current.

4,628,430

SWITCHING POWER-SUPPLY UNIT WITH IMPROVED START-UP BEHAVIOR

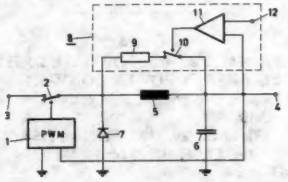
Georg Mastner, Niederrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 22, 1984, Ser. No. 582,484

Claims priority, application Switzerland, Feb. 28, 1983, 1088/83

Int. Cl.[4] G05F 1/56

U.S. Cl. 363—25 **13 Claims**



1. A switching power-supply unit having a DC-voltage input, which unit is normal operation generates at an output an output voltage which at least approximately corresponds to a rated value, and which includes a pulse-width modulator that is controlled by said output voltage; a first switch which is actuated by said modulator; and, at said output, a low-pass filter including an inductance and a capacitance, the improvement wherein said power-supply unit includes a bypassing circuit which bypasses said inductance, the impedance of said bypassing circuit having an inductive component which is low relative to said inductance, said bypassing circuit being conductive when said output voltage is below a minimum value that is not higher than said rated value of said output voltage, said first switch actuated by said modulator located between

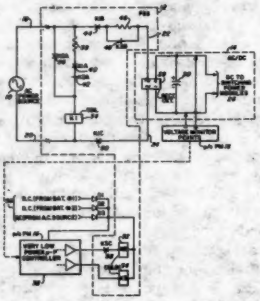
the input of said power-supply unit and said low-pass filter, the input of said low-pass filter connected to ground by a free-wheeling diode, said bypassing circuit including a second switch which is actuated by a comparator which compares said output voltage with a reference voltage.

4,628,431

POWER SUPPLY ON/OFF SWITCHING WITH INRUSH LIMITING

Dennis J. Kayser, Hudson, N.H., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Dec. 12, 1984, Ser. No. 681,156
Int. Cl.[4] H02H *7/125*
U.S. Cl. 363—49 **6 Claims**



1. Power switching means for selectively connecting a power source to a digital data processing system, comprising:

(A) first switching means for connecting the power source to the system,

(B) means for providing a power on selection signal,

(C) second switching means for providing an initial turn-on signal to the first switching means in response to receiving an enabled power on selection signal, and

(D) third switching means having an active state and a normal state and

(1) arranged when in the active state to enable the second switching means to be responsive to the power on selection signal, and

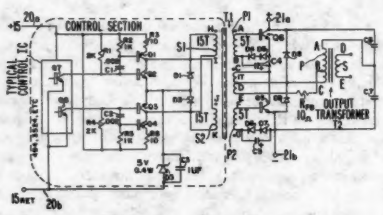
(2) arranged when in the normal state to provide a sustaining signal to the first switching means.

4,628,432

PROPORTIONAL TRANSISTOR BASE DRIVE CIRCUIT FOR USE IN POWER CONVERTERS

Kenneth T. Small, Cupertino, Calif., assignor to Boschert Inc., Milpitas, Calif.

Filed May 29, 1984, Ser. No. 615,009
Int. Cl.[4] H03K *3/16;* **H02M** *3/28*
U.S. Cl. 363—56 **13 Claims**



1. A power converter comprising:

an output transformer containing a primary winding and a secondary winding;

first means for causing current to flow through said primary winding in a first direction;

second means for causing current to flow through said primary winding in a second direction; and

means for feeding back a voltage proportional to a poriton of the voltage across said primary winding to said first and second means, the current flow caused by said first and second means being responsive to said voltage, thereby maintaining the current through said primary winding;

wherein said means for feeding back comprises:

means for applying a voltage proportional to the voltage across said primary winding to said first means for causing following the initiation of the current through said primary winding in said first direction thereby to regeneratively maintain said current through said primary winding in said first direction; and

means for applying a voltage proportional to the voltage across said primary winding to said second means for causing following the initiation of the current through said primary winding in said second direction thereby to regeneratively maintain current through said primary winding in said second direction, and

wherein said first means for causing comprises:

a first transistor, the collector of which is connected through a first capacitor to one end of said primary winding and the emitter of which is connected through a current feedback coil to the other end of said primary winding and the base of which is connected to a first source of a turn-on pulse, and

wherein said second means for causing comprises:

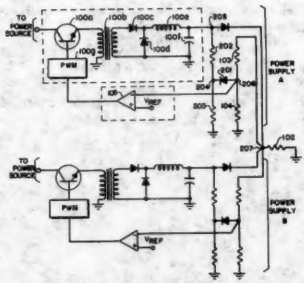
a second transistor, the emitter of which is connected through a second capacitor to one end of said pirmary winding, the collector of which is connected through said current feedback coil to the second end of said primary winding, and the base of which is connected to a second source of a turn-on pulse.

4,628,433

CONTROL CIRCUIT FOR DIODE-OR CONNECTED POWER SUPPLIES

Hubertus S. Notohamiprodjo, Hoffman Estates, Ill., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Dec. 30, 1985, Ser. No. 814,937
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—65 **11 Claims**



1. A control circuit for a power supply diode-or connected in a power supply system including a plurality of power supplies each power switching circuit being connected to a load via an output diode, said control circuit comprising:

first voltage indicating means connected between said load and said output diode and effective to provide a first signal representative of the voltage applied to said load;

second voltage indicating means connected between said power switching circuit and said output diode and effective to provide a second signal representation of the output voltage of said power switching circuit; and

switching means connected between said first and second voltage indicating means and operated in response to said first signal having a magnitude larger than said second signal to electrically connect said first voltage indicating means to said second voltage indicating means;

said comparator being operated in response to said first signal having a magnitude larger than predetermined value to provide a control signal representative of the difference between said first signal and said predetermined value;

said power switching circuit being operated in response to said control signal to increase its output voltage by a proportionate amount.

4,628,434

FACILITIES CONTROL METHOD

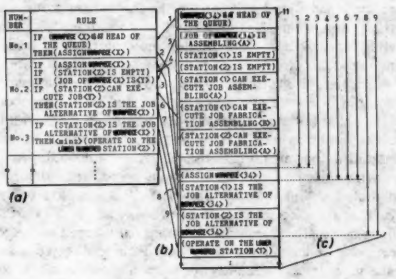
Tsutomu Tashiro, Sagamihara; Koichi Haruna, Yokohama, and Norihisa Komoda, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 8, 1984, Ser. No. 608,164

Claims priority, application Japan, May 9, 1983, 58-79341

Int. Cl.[4] G06F *15/18, 15/46*

U.S. Cl. 364—130 **2 Claims**



1. A control system having a controller for controlling the operation of a plurality of facilities in real time, and memory, coupled to said controller, for storing information in accordance with which said controller controls the operation of said facilities, wherein

said memory comprises

first memory means for storing facility status signals representative of the statuses of the facilities, command signals responsive to said status signals and information representative of correspondence between said status signals, said command signals and internal codes,

second memory means for storing information for specifying a series of rules to be triggered in accordance with the statuses of the facilities,

third memory means for storing rules converted into said internal codes, and

fourth memory means for storing internal codes of conclusions sequentially formed in accordance with the operation of control commands for corresponding facilities on the basis of the internal codes representative of the statuses of the facilities and internal codes representative of rules, and finally determined internal codes, and wherein

said controller comprises

settling means for monitoring the facility status signals and controlling the generation of said facility status signals, and the number of rule-set for use on the basis of the information stored in said second memory means,

internal code generating means for generating internal codes corresponding to said generated facility status signals on the basis of the information stored in said first memory means,

determining means for reading out corresponding rules from said third memory means on the basis of said number of the rule set having been determined by said settling means and for determining a final control command in accordance with information stored in said fourth memory means, and

command signal generating means for generating a command signal for a facility in accordance with an internal code for a determined control command on the basis of the information stored in said first memory means.

4,628,435

FACILITIES CONTROL METHOD

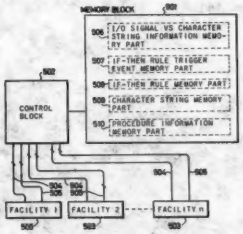
Tsutomu Tashiro, Sagamihara; Koichi Haruna, Yokohama, and Norihis Komoda, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 9, 1984, Ser. No. 578,676

Claims priority, application Japan, Mar. 9, 1983, 58-37392

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—130 **6 Claims**



1. A control system having a controller, for controlling the operation of a plurality of facilities in real time, and memory, coupled to said controller, for storing information in accordance with which said controller controls the operation of said facilities, wherein

said memory comprises

a rule memory portion which stores information representative of a plurality of rules, each rule containing a conditional portion which describes at least one condition to be examined and a conclusive portion which describes an action to be taken upon said condition being satisfied, and

a status memory portion which stores information representative of the current status of each of said facilities, information representative of respective tasks to be performed by said facilities and information representative of the new current status of each of said facilities resulting from the satisfaction of the conditional part of a rule and wherein

said controller comprises

detecting means for detecting the current status of each of said facilities and generating information representative thereof,

input means, coupled with said detecting means, for coupling facility status representative information generated by said detecting means to the status memory portion of said memory to be stored thereby,

rule applying means for comparing current status information stored in said status memory with information representative of the conditional portions of the rules stored in said rule memory portion and, in response to the satisfaction of the conditional part of a rule, causing information representative of the conclusive portion of that rule to be stored as the new current status of a facility in the status memory portion of said memory, and for generating information representative of control instructions for controlling the operation of said facilities, said control instruction information being formed by a combination of rules conditional portions of which have been satisfied by the current status of said facilities, and

output means, coupled to said rule applying means, for

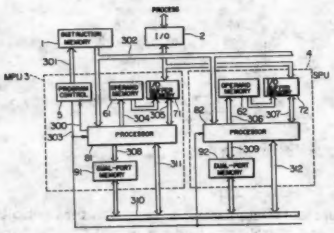
generating command signals for controlling the operation of said facilities in accordance with the control instruction information generated by said rule applying means, and coupling said command signals to respective ones of said facilities.

4,628,436

DIGITAL CONTROLLER

Tadashi Okamoto, and Hiromasa Yamaoka, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,541
Claims priority, application Japan, Feb. 24, 1983, 58-28541
Int. Cl.[4] G06F *15/16, 9/00*
U.S. Cl. 364—131 3 Claims



1. A digital controller for controlling a plurality of objectives to be controlled, which objectives are of the same kind, wherein a plurality of processors are provided in correspondence to said plurality of objectives, comprising:

an instruction memory for storing instruction codes which are provided as a common control program for controlling said plurality of processors to execute said objectives, and addresses of storage locations holding operand addresses associated with said instruction codes;

common control means connected to said instruction memory and said plurality of processors for reading out an instruction code and the associated storage location address from said instruction memory to all of said processors, and for generating a parallel execution process signal in each of said processors to effect execution of said instruction code in parallel by said processors;

an operand memory provided in each of said processors, each operand memory having storage locations storing operand addresses, which storage locations are accessed by the same storage location address read out from said instruction memory; and

an input/output data buffer memory provided in each of said processors and operatively associated with the operand memory therein for storing data accessed by the operand addresses stored in said operand memory;

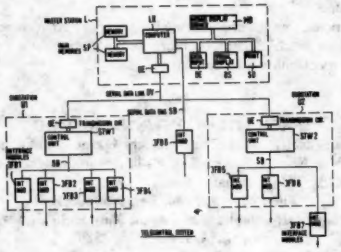
wherein a similar operation is carried out in each of said processors in parallel in response to the same instruction code read out from said instruction memory and data accessed from the input/output data buffer memory provided in each of the processors on the basis of the operand address which is obtained by accessing the operand memory with the storage location address associated with the instruction code read out of said instruction memory.

4,628,437

TELECONTROL SYSTEM

Werner Poschmann, Renningen; Wolfgang Klenner, Ditzingen; Günter Wattach, Walzbachtal, and Peter Maas, Pforzheim, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,645
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1982, 3236812
Int. Cl.[4] G08C *19/00*; H04Q *9/00*
U.S. Cl. 364—131 3 Claims



1. A telecontrol system with at least one master station and a plurality of substations connected to the master station via data transmission units, each substation containing a control unit equipped with a microcomputer and a plurality of plug-in interface modules connected to the control unit and serving to enter messages and measured values and to deliver commands, wherein said interface modules are equipped with microcomputers, and that both the control unit and all interface modules of a substation have interfaces to, and are interconnected by, a serial data bus permitting the use of protection coding techniques wherein each interface module has a first subcircuit which includes said microcomputer, and is coupled to said control unit by a serial data bus over which said interface module is cyclically scanned for temporarily stored messages; and a second subcircuit for providing isolation between said interface module and a facility to be monitored, and wherein said first subcircuits in all interface modules are of the same design and contain, besides the microcomputer with main memory and program memory and the interface to the serial data bus, a function-code memory in which the function of the respective interface module can be fixed by coding, and wherein said second subcircuit includes all components necessary for adaptation to the technical facility to be monitored and controlled.

4,628,438

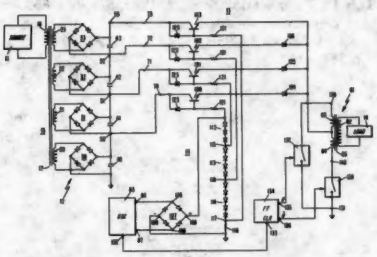
POWER CONVERTER APPARATUS AND METHOD EMPLOYING PLURAL BRANCHES

Herbert R. Montague, Binghamton, N.Y., assignor to Control Concepts Corporation, Binghamton, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,185
Int. Cl.[4] H02M *7/538*
U.S. Cl. 363—134 5 Claims

1. A converter wherein a DC input is converted to AC in response to a gradually changing sinusoidal control source comprising N branch circuits, where N is an integer greater than one, input means connected to the DC input for coupling DC to each of the branch circuits, output means coupled to each of the branch circuits for deriving the AC output, branch circuit k being connected between the input and output means, where k is selectively one through N, branch circuit k including variable response means responsive to the control source so that branch circuit k is conducting to the exclusion of all other branch circuits in response to the control source amplitude being in a predetermined range, the variable response means of branch circuit k, while conducting, responding to the control

source to have an output with a gradually changing envelope, branch circuit k being connected to the input and output means so the envelope changes between a minimum voltage for branch circuit k to a maximum voltage for branch circuit k and the source being arranged so that each branch circuit while conducting responds to the gradual changes of the source to dissipate the same amount of energy, the minimum voltage for branch circuit (k+1) being approximately equal to the maximum voltage for branch circuit k, the output means including means for combining the outputs from the N branch circuits, and means for coupling the sinusoidal source to branch circuit k to cause the phase angle, θ_k, when branch circuit k changes from a conducting to a non-conducting state, and the phase angle θ_{k-1}, when branch circuit k begins to conduct, to be such that $\sin \theta_k \cos \theta_{k-1} - (\theta_k - \theta_{k-1})/2 - \frac{1}{4}(\sin 2\theta_k + \sin 2\theta_{k-1})$ is the same for each branch circuit.



4,628,439

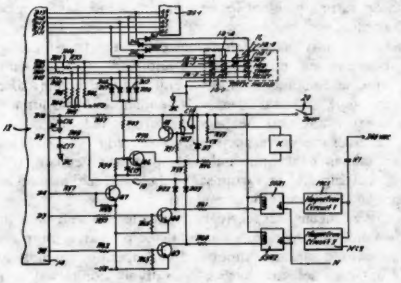
SUPERVISED START SYSTEM FOR MICROPROCESSOR BASED APPLIANCE CONTROLS

Daniel L. Fowler, Kentwood, and Brian J. Kadwell, Holland, both of Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 12, 1983, Ser. No. 560,169

Int. Cl.⁴ G05B *9/02, 15/02;* H05B *6/64*

U.S. Cl. 364—138 **15 Claims**



1. A supervisory start system for an appliance control that includes a microprocessor, manually actuatable keyboard switch means, and first and second relay means;

the microprocessor including first, second and third input means and first, second and third output means and being conditioned to generate control signals at said output means upon receipt of electrical signals at said input means;

said supervisory start circuit comprising, in combination, first, second and third transistors each having a base, an emitter and a collector, said first transistor means controlling energization of said first relay means and being controlled by said manually actuatable switch means;

said manually actuatable switch means being electrically connected to said first output means of said microprocessor and said base of said first transistor;

the base of said second transistor being connected to said second output means of said microprocessor, the emitter of said second transistor being connected to a source of potential, the collector of said second transistor being connected to the emitter of said first transistor;

the collector of said first transistor being connected to said first relay means;

said second transistor being operable to connect the emitter of said first transistor to said source of potential when a signal from said second output means of said microprocessor is applied to the base of said second transistor;

said microprocessor being conditioned to emit a signal at said second output means upon receipt of a signal at said first input means;

means for latching said first transistor in a conducting condition upon being energized;

means for applying an electrical signal to said second input means when said first transistor means is in a conducting condition;

said third transistor having the base thereof connected to said third output means of said microprocessor, said third transistor having the emitter thereof connected to said source of potential and the collector thereof connected to said second relay means, said third transistor being operable to connect said relay means to said source of potential upon receipt of a signal from said third output means of said microprocessor; and

said microprocessor being conditioned to emit a signal at said third output means upon receipt of a signal at said second input means.

4,628,440

ELECTRICAL APPLIANCE CONTROL

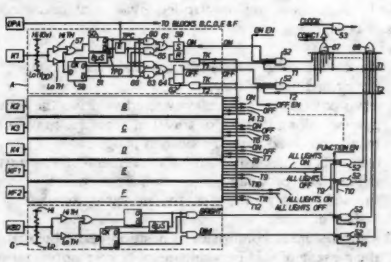
David R. Thompson, Fife, Scotland, assignor to Pico Electronics Limited, Scotland

Continuation of Ser. No. 436,647, Oct. 25, 1982, abandoned. This application Nov. 12, 1985, Ser. No. 796,531

Claims priority, application United Kingdom, Oct. 26, 1981, 8132173

Int. Cl.⁴ G05B *11/01;* H04M *11/04;* H01N *9/26*

U.S. Cl. 364—140 **27 Claims**



1. A transmitter for controlling n slave units by means of a digital control signal containing an area code common to said n slave units, an address for at least one of said n slave units and a command, the transmitter comprising:

first means for generating an area code;

second means for generating selectively any one of n addresses for respective ones of said n slave units;

third means for generating a command;

m (<n and >1) actuator means coupled to the first, second and third generating means such that a single actuation of one of said m actuator means causes the generation of a digital control signal comprising said area code, an address selected from said n addresses, and said command; and

address selector means presettable to any one of a plurality of conditions, each of which condition presets a group of

m addresses where m is less than n, for defining which addresses constitute said group of m addresses;

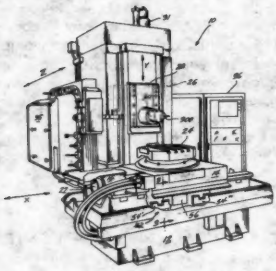
whereby all n slave units, in sequence of operation of said selector means, are controllable by said actuator means of said transmitter in groups of up to m slave units for each condition of the selector means.

4,628,441

AUTOMATIC DYNAMIC ERROR COMPENSATOR

Richard Johnstone; Edward E. Kirkham, both of Brookfield; Han C. Chung, West Allis, and Lyle D. Ostby, Milwaukee, all of Wis., assignors to Kearney & Trecker Corporation, Milwaukee, Wis.

Filed Jun. 29, 1983, Ser. No. 509,214
Int. Cl.[4] G05B *19/18, 19/29;* G06F *15/46*
U.S. Cl. 364—167 10 Claims



1. In a machine tool controlled by a numberical control circuit comprising:

a base,

a movable member carried by said base for movement in a prescribed path of travel,

a servo positioning system connected to drive the movable member along its path of travel in accordance with commands received from a recorded program,

a transducer responsive to the movement of the movable member for producing a position signal which represents the indicated position of the movable member at any instant of time,

the improvement comprising, a position verifier actuated by the passage of said movable member past a predetermined point on said base to produce a verifier signal indicating a precise actual position of the movable member at the instant said verifier signal occurs,

a feedback processor coupled to receive the position signal from said transducer,

means coupling said feedback processor to receive the verifier signal from said position verifier,

means in said feedback processor for determining the difference between the indicated position of the movable member as represented by said transducer position signal and the actual position as represented by said verifier signal and to generate therefrom a compensation factor signal,

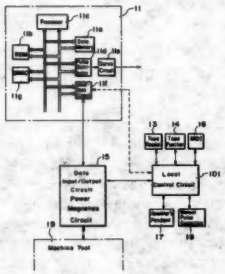
and adjustment means in the numerical control circuit connected to receive said compensation factor signal for adjusting the control of the movement of the movable member so that it is precisely positioned according to the command from the program.

4,628,442

CENTRALIZED PERIPHERAL INTERFACE WITH A NUMERICAL CONTROL UNIT

Shinichi Isobe, and Kazuo Sawada, both of Hino, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP82/00379, § 371 Date May 18, 1983, § 102(e) Date May 18, 1983, PCT Pub. No. WO83/01129, PCT Pub. Date Mar. 31, 1983
Continuation of Ser. No. 499,163, May 18, 1983, abandoned.
This PCT application Sep. 22, 1982, Ser. No. 808,665
Claims priority, application Japan, Sep. 22, 1981, 56-149819
Int. Cl.[4] G05B *19/18;* G06F *15/00*
U.S. Cl. 364—167 6 Claims



1. A numerical control apparatus for controlling a machine, comprising:

a numerical control unit;

a data input unit for entering NC data into said numerical control unit;

a manual data input unit for manually entering NC data into said numerical control unit;

an operator's pendant for entering data into said numerical control unit;

a local control circuit for controlling the transfer of data between said data input unit and said numerical control unit, said manual data input unit and said numerical control unit, and said operator's pendant and said numerical control unit, said local control circuit including:

receiver means, respectively connected to said data input, said manual input and said operator's pendant, for receiving NC data from said data input, said manual input and said operator's pendant;

driver means, respectively connected to said data input and said operator's pendant, for providing output NC data to said data input and said operator's pendant;

first data selector means, operatively connected to said receiver means, for selectively providing said received NC data in response to control signals;

second data selector means, operatively connected to said driver means, for providing said output NC data to said driver means in response to said control signals;

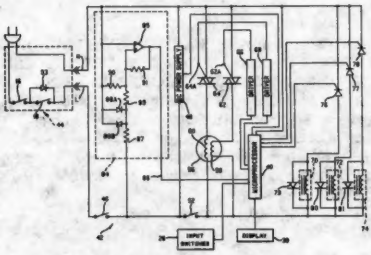
shift register means for receiving in parallel said received NC data from said first data selector means, for providing in parallel said received NC data to said second data selector means, for serially receiving over a single data line said output NC data for said second data selector means, and for serially providing over said single data line said received NC data from said first data selector means, such that said numerical control unit selectively exchanges NC data with said data input unit, said manual input and said operator's pendant over said single data line.

4,628,443

TEST INITIATING APPARATUS FOR APPLIANCES HAVING SELF-DIAGNOSTIC TESTING CAPABILITY

Jimmy R. Rickard, and Robert K. Hollenbeck, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Nov. 16, 1984, Ser. No. 672,070
Int. Cl.[4] G05B *9/02*; G06F *11/00*; H04M *11/04*
U.S. Cl. 364—184 9 Claims



1. For an appliance of the type having a control circuit including logic control means for operating the appliance in a start-up mode each time power is applied to the control circuit and thereafter selectively in a normal operating mode or in a self-diagnostic/test mode, and energized by an alternating current power signal from an external power supply having a fixed nominal frequency coupled to the appliance by power lines, apparatus for initiating operation in the self-diagnostic/test mode comprising:

test circuit means adapted for connection in the power lines between the appliance and the power supply, said test circuit means being selectively switchable between a first state and a second state and operative in its first state to suppress power signal half-cycles of one polarity and in its second state to couple the power signal unchanged to the appliance control circuit;

means included in the control circuit for generating interrupt pulses marking the zero crossings of the power signal;

means included in the logic control means operative in the start-up mode to monitor the pulse rate of said interrupt pulses for a period of predetermined duration and detect a pulse rate different from that associated with the normal power supply frequency and to initiate operation in the self-diagnostic/test mode if such a change is detected and to initiate operation in the normal mode otherwise, whereby appliance operation in the self-diagnostic/test mode is initiated by switching said test circuit to its first state.

4,628,444

OPERATING INFORMATION INPUT METHOD IN NUMERICAL CONTROL APPARATUS

Ryoichiro Nozawa; Nobuyuki Kiya, and Motoaki Yoshino, all of Tokyo, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP83/00325, § 371 Date May 14, 1984, § 102(e) Date May 14, 1984, PCT Pub. No. WO84/01443, PCT Pub. Date Apr. 12, 1984
PCT Filed Sep. 30, 1983, Ser. No. 616,216
Claims priority, application Japan, Oct. 1, 1982, 57-172862
Int. Cl.[4] G05B *19/00*; G06F *3/00*
U.S. Cl. 364—188 10 Claims

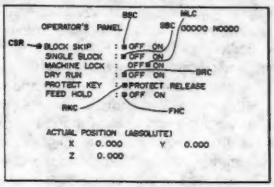
7. An operating information input method in a numerical control apparatus having a keyboard, a display with a screen and which executes prescribed numerical control processing based on numerical control program data and operating information items, said method comprising the steps of:

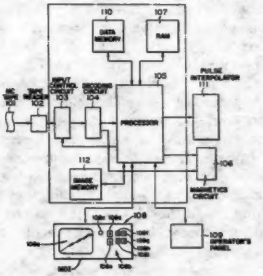
(a) desginating the start of inputting operating information items;

(b) displaying on the screen characters corresponding to a page of said operating information items including selectable items;

(c) positioning a first cursor on the screen for selecting a disired operating information item;

(d) moving a second cursor associated with said desired operating information item to identify a selectable item; and





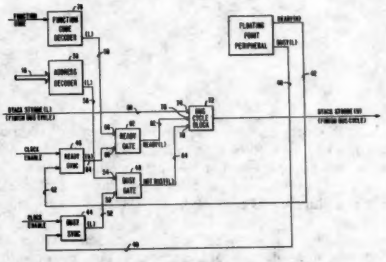
(e) displaying a bar graph on the screen in accordance with the movement of said second cursor to specify an operating quantity of said identified selectable item in accordance with the length of said graph.

4,628,445

APPARATUS AND METHOD FOR SYNCHRONIZATION OF PERIPHERAL DEVICES VIA BUS CYCLE ALTERATION IN A MICROPROCESSOR IMPLEMENTED DATA PROCESSING SYSTEM

Joseph P. Buonomo; Raymond E. Losinger, both of Endicott; Burton L. Oliver, Nanticoke, and Daniel J. Sucher, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 542,934, Oct. 18, 1983, abandoned. This application Apr. 7, 1986, Ser. No. 848,620
Int. Cl.[4] G06F *13/42*
U.S. Cl. 364—200 5 Claims



2. A data processing system including a system bus, a processor means connected to the system bus, a peripheral device connected to the system bus, a storage means connected to the system bus for storing an address representative of said peripheral device, and an apparatus connected to said processor means and to said peripheral device for determining if said peripheral device is busy or not ready and for placing said

processor means in a waiting state when said peripheral device is busy or not ready, said processor means retrieving said address from said storage means and placing said address on said system bus when an access to said peripheral device during a current bus cycle is desired, said processor means developing a function code output signal when an access to said peripheral device during a subsequent bus cycle is desired, said processor means developing a strobe bus cycle signal representative of an attempt by said processor means to access said peripheral device, said peripheral device developing a ready signal when said peripheral device is ready to accept an access and a busy signal when said peripheral device is busy with an operation, said apparatus comprising:

first means responsive to said function code output signal from said processor means and to said ready signal from said peripheral device for developing a further ready signal when said ready signal indicates said peripheral device is ready to accept said access and said function code output signal indicates said operation is not to be performed by said peripheral device;

second means responsive to the presence or absence of said address on said system bus and to said busy signal from said peripheral device for developing a not busy signal when said address has not been placed on said system bus by said processor means and said busy signal indicates said peripheral device is not busy with said operation; and

third means responsive to said further ready signal, to said not busy signal, and to said strobe bus cycle signal for further developing said strobe bus cycle signal in response to said further ready signal and said not busy signal and for blocking the further development of said strobe bus cycle signal in response to the absence of either said further ready signal or said not busy signal,

said processor means being placed in said waiting state when the further development of said strobe bus cycle signal is blocked.

4,628,446

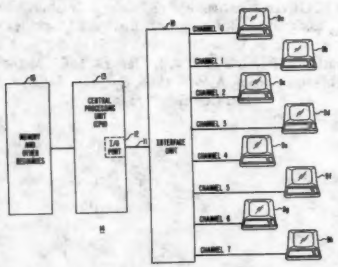
MULTICHANNEL INTERFACE

Charles W. Hoffner, II, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 6, 1982, Ser. No. 447,272

Int. Cl.[4] G06F *13/38*

U.S. Cl. 364—200 **33 Claims**



1. A method of interfacing a plurality of narrow-word communication channels to a wide-word communication channel wherein each narrow word appearing on a narrow-word communication channel has a predetermined interval of duration including a plurality of time slots, the method comprising the steps of:

sampling each narrow-word communication channel a plurality of times during each interval to obtain a plurality of samples of each narrow word appearing on each narrow-word communication channel;

storing the samples for processing;

during each one of a plurality of time slots of each interval, processing stored samples of a different one narrow-word communication channel selectively to identify among the processed samples of each narrow-word communication channel a particular sample of a narrow word appearing on that narrow word communication channel;

during a plurality of intervals, storing for each narrow-word communication channel particular samples of a plurality of narrow words appearing on that narrow-word communication channel to assemble from the particular samples a wide word associated with that narrow-word communication channel; and

supplying each assembled wide word to the wide-word communication channel.

4,628,447

MULTI-LEVEL ARBITRATION SYSTEM FOR DECENTRALLY ALLOCATING RESOURCE PRIORITY AMONG INDIVIDUAL PROCESSING UNITS

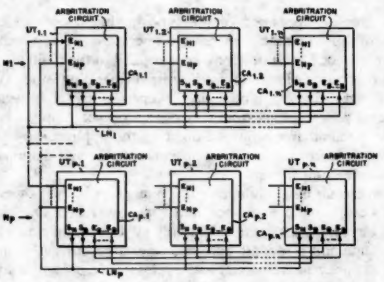
Roger Cartret, and Giovanni Volpe, both of Colombes, France, assignors to Thomson CSF Telephone, Paris, France

Continuation of Ser. No. 281,108, Jul. 7, 1981, abandoned. This application Nov. 2, 1984, Ser. No. 667,391

Claims priority, application France, Jul. 8, 1980, 80 15156; Jul. 31, 1980, 80 16921

Int. Cl.[4] G06F *15/16, 13/18*

U.S. Cl. 364—200 **2 Claims**



1. Apparatus for decentrally allocating resource priority among the individual processing units in a multi-processor system, each unit being assigned to a processing level and an individual position within that level, said apparatus including a plurality of arbitration means, each one coupled to a corresponding unit and to all other arbitration means in said system, each arbitration means comprising:

first logic means for receiving at each of a plurality of first inputs, each input being coupled to all arbitration means of a given processing level, a first indicating signal indicating whether a request for resource access has been made by a unit of said given level, and for producing a first output signal at one of a plurality of first outputs, each output being coupled to arbitration means of one of said levels, said first output signal indicating which level will be granted priority in accordance with said first indicating signal and priority data stored in said first logic means, level priority being granted sequentially to all requesting levels;

second logic means for receiving at each of a plurality of second inputs, each second input being coupled to a given unit with a same level as said corresponding unit, a second indicating signal indicating whether a request for resource access has been made by said given unit, and for producing a second output signal at one of a plurality of second outputs, said second output signal indicating which unit will be granted priority in accordance with said second indicating signal and priority data stored in said second logic means, unit priority being granted sequentially to all requesting units, and level priority having priority over unit priority;

third logic means connected to one of said first outputs and to one of said second outputs for producing a signal granting resource access to said corresponding unit when said

first and second output signals indicate that level and unit priority are to be granted to said corresponding unit; and

means responsive to a request for resource access by said corresponding unit for producing a third output signal to be applied to one of said second inputs of said second logic means and to second inputs of said second logic means of other arbitration means on said given level, and for producing a fourth output to a applied to one of said first inputs of arbitration means of other levels.

4,628,448

OPERATION MODE SETTING APPARATUS ON A SINGLE CHIP MICROPROCESSOR

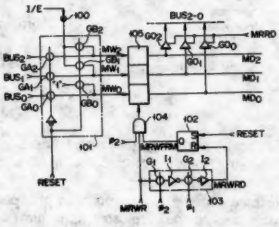
Yutaka Murao, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 367,661, Apr. 12, 1982, abandoned. This application Nov. 29, 1984, Ser. No. 675,270

Claims priority, application Japan, Apr. 21, 1981, 56-60127

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—200 **1 Claim**



1. An operation mode setting apparatus on a single chip microprocessor having an internal bus which comprises:

an n-bit operation mode-setting register means for storing the data which specifies one of 2^n operation modes, which modes include two start operation modes;

a single external pin connection for receiving externally supplied logic level signals for specifying one of the two start operations modes;

a first circuit means for generating, according to the logic level signal on said external connection pin, the data for designating the start operation mode;

a second circuit means for causing mode-setting data generated through a user program execution to select one of the 2^n operation modes;

a selector means for allowing said data for designating the start operation mode to be latched into the operation mode-setting register means at the reset state of the microprocessor and for selectively allowing said mode-setting data on the internal bus of the microprocessor to be latched into the operation mode-setting means after the reset state of the microprocessor; and

means for preventing data from being written in the mode-setting register means, until the microprocessor is again brought to a reset state after data is written in the mode-setting register means through said user program execution after the release of the reset state of the microprocessor.

4,628,449

VECTOR INTERRUPT SYSTEM AND METHOD

Fredrick L. Zardiackas, Sunnyvale, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Nov. 14, 1983, Ser. No. 551,300

Int. Cl.[4] G06F *9/46*

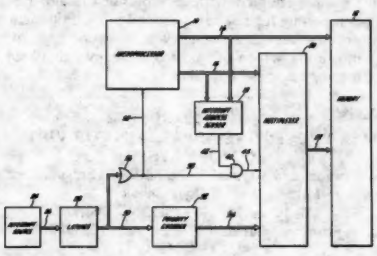
U.S. Cl. 364—200 **5 Claims**

1. A microprocessor system for servicing multiple interrupts, including,

microprocessor means for executing instructions,

memory means, connected by an address bus to said microprocessor means, for storing instructions and data, and

circuit means, connected to said microprocessor means and said memory means, for sensing the presence of one or



more copending interrupt requests and for servicing a second one of said co-pending interrupt requests directly after servicing a first one of said co-pending interrupt requests without first performing a restore operation followed by a store operation.

4,628,450

DATA PROCESSING SYSTEM HAVING A LOCAL MEMORY WHICH DOES NOT USE A DIRECTORY DEVICE WITH DISTRIBUTED RESIDENT PROGRAMS AND A METHOD THEREFOR

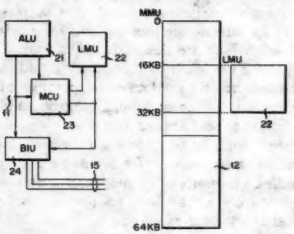
Fumitaka Sato, 4-18-3, Imadera, Oome-shi, Tokyo, and Kunihiro Nagura, 39-4-408, 1618-1, Ooazayamaguchi, Tokorozawa-shi, Saitama-ken, both of Japan

Continuation of Ser. No. 422,953, Sep. 24, 1982, abandoned. This application Dec. 18, 1985, Ser. No. 810,884

Claims priority, application Japan, Sep. 29, 1981, 56-153045

Int. Cl.[4] G06F *12/00*

U.S. Cl. 364—200 **9 Claims**



1. A data processing system comprising:

(a) a main memory having a first plurality of addressable memory locations;

(b) a central processing unit coupled with said main memory including means for producing a current address and, selectively, an access command to said main memory or a local memory using said current address;

(c) a local memory, coupled with said central processing unit, including:

(i) a second plurality of addressable memory locations having the same addresses as a fixed subset of said first plurality of addressable memory locations; and

(ii) means for addressing said second plurality in place of said main memory without use of a directory, using said same addresses and said access command;

so that data from said main memory is not rolled in and out of said local memory;

(d) memory control means for receiving said access command from said central processing unit and providing memory control outputs to said main memory and local memory including:

(i) means for comparing the address of said subset with said current address, which provides an output indicating whether said current address corresponds to a location within said subset; and

(ii) means, coupled with said output of said means for comparing, for selectively supplying to said main memory and said local memory at least one control signal indicating which of said main memory and said local memory is to be accessed.

4,628,451

DATA PROCESSING APPARATUS FOR VIRTUAL MEMORY SYSTEM

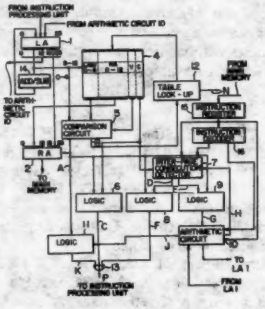
Hideo Sawada, and Kiyoshi Yata, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1983, Ser. No. 462,120

Claims priority, application Japan, Feb. 12, 1982, 57-20721

Int. Cl.⁴ G06F *9/34*

U.S. Cl. 364—200 **10 Claims**



1. A data processing apparatus for a virtual memory system comprising:

a first register for holding a logical address;

a main memory including a plurality of addressable memory blocks for storing instructions and for storing multi-byte operands which are designated by a logical address of a top byte of the multi-byte operand in said instructions;

instruction means for holding and decoding an instruction to be executed and for supplying a logical address from said instruction to said first register;

table means for effecting address translation of said logical address to a real address for accessing said main memory, including a plurality of entries, each entry having a logical block address, a real block address corresponding to said logical block address and an indication bit indicative of whether an entry of a memory block logically adjacent to the memory block designated by the logical block address in the entry is present in said table means;

means connected to said first register and said table means for reading out an entry from said table means on the basis of the content of said first register;

a second register connected to said first register and said table means for holding a real address for the access of said main memory, said real address being composed of a part of the logical address received from said first register and the real block address in a read out entry from said table means;

means connected to said reading out means for generating a signal indicative of the fact that all bytes of a multi-byte operand designated by an instruction read out from said main memory and held by said instruction means are address-translatable by said table means at the time the address of the top byte of the operand is placed in said first register to read out an entry from said table means, when said indication bit in the read out entry indicates the presence of an entry of the next-adjacent memory block in said table means; and

address generating means connected to said reading out means and said instruction means for generating and providing to said first register the byte address of the last byte of said multi-byte operand determined in accordance with said instruction held by said instruction means, when said indication bit in the read out entry indicates the absence of an entry of the adjacent memory block in said table means.

4,628,452

ELECTRONIC CASH REGISTER SYSTEM WITH INPUT VERIFICATION

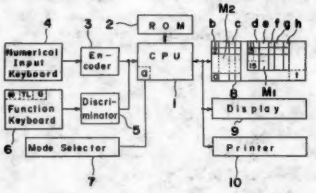
Fusahiro Shiono, Habikino, and Kensaku Komai, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 20, 1983, Ser. No. 515,456

Claims priority, application Japan, Jul. 30, 1982, 57-133934

Int. Cl.⁴ G06F *15/02, 15/21*

U.S. Cl. 364—405 **4 Claims**



1. An electronic cash register comprising:

data processing means for processing data stored in and input to said cash register;

input means associated with said data processing means for inputting to said cash register amounts of money to be registered during the course of a transaction;

first memory means associated with said data processing means for storing a plurality of money amounts representing upper limits and lower limits of amounts of money which are permitted to be registered during the course of a transaction, said first memory means also storing a code associated with each money amount stored therein; and

second memory means associated with said data processing means for storing a plurality of codes associated with a plurality of different kinds of transactions which may be executed by said cash register, said codes stored in said second memory means corresponding to said codes stored in said first memory means for defining upper and lower limits of amounts of money which are permitted to be registered by said cash register during each of said different kinds of transactions by reference to money amounts in said first memory means corresponding to codes associated with a selected kind of transaction,

said data processing means comprising means for comparing money amounts input by said input means with amounts stored in said first memory means.

4,628,453

NAVIGATION APPARATUS FOR MOBILE SYSTEM

Kohji Kamejima; Yuji Hosoda, both of Ibaraki; Yoshiyuki Nakano, Hitachi; Masakatsu Fujie, Ibaraki; Taro Iwamoto, Mito; Kazuo Honma, and Takashi Yoshida, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 655,541

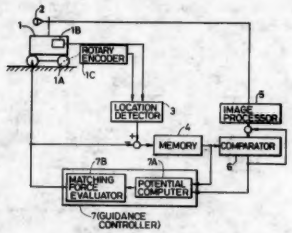
Claims priority, application Japan, Oct. 17, 1983, 58-192353

Int. Cl.⁴ G06F *15/50*

U.S. Cl. 364—424 **8 Claims**

1. A navigation apparatus for guiding a mobile system along a predetermined path comprising means to detect a path movement of the mobile system, memory means to store three-dimensional predictive patterns relating to positional information of the mobile system, vision means to observe an actual environment and to detect an actual image thereof, image processing means to extract an observed feature pattern from the

observed image obtained with said vision means, and guidance control means to compare the observed feature pattern from said image processing means and the predicted pattern delivered from said memory means in accordance with the positional information of the mobile system and to provide a guidance signal for the mobile system as an output.

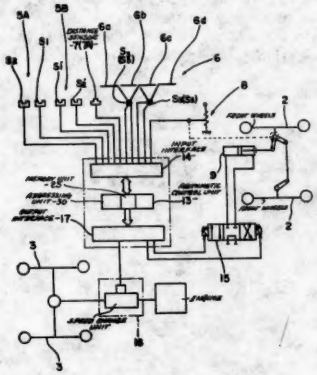


4,628,454

AUTOMATIC RUNNING WORK VEHICLE

Katsumi Ito, Osaka, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed May 20, 1983, Ser. No. 496,566
Claims priority, application Japan, Jul. 13, 1982, 57-121565
Int. Cl.[4] G06F *15/50*; B62D *1/28*
U.S. Cl. 364—424 **7 Claims**



1. An automatic running work vehicle controllable to travel along a series of parallel straight courses on a defined work site, following a boundary between a worked area and an unworked area, and to reverse its travelling direction at an end of each of the courses, said vehicle comprising:

a plurality of position sensor means for detecting said boundary and a beginning and an end of said courses,

transmitter means for transmitting a pulse per unit of travelling distance upon detection of said beginning of the course by said position sensor means, and for continuing to transmit said pulse per unit of travelling distance until detection of said end of the course by said position sensor means,

orientation sensor means for detecting the travelling direction of the vehicle and for transmitting an orientation signal,

storing means for (i) counting the pulses when the vehicle starts running along the straight course, (ii) receiving said orientation signal when the count reaches a predetermined value, (iii) successively storing in order, pairs of data, each pair consisting of running distance data corresponding to said count and orientation data, and (iv) successively reading out said pairs of the data in reverse order to said order of storing said data, when the travelling direction of the vehicle is reversed at the end of said course, and

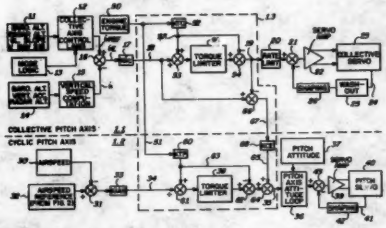
steering control means operatively connected to said position sensor means and said storing means for (a) steering said vehicle along said boundary in accordance with the detection of said boundary by said position sensor means and (b) steering said vehicle in accordance with said stored pairs of data in response to said boundary remaining undetected by said position sensor means for a predetermined time.

4,628,455

CROSS AXIS TORQUE LIM'TER FOR HELICOPTER AUTOPILOT

Edmund Skutecki, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed May 6, 1983, Ser. No. 492,294
Int. Cl.[4] G06F *15/50*; G06G *7/78*
U.S. Cl. 364—434 **12 Claims**



1. A flight control system for helicopters having cyclic pitch means for controlling the pitch attitude thereof and collective pitch means for controlling the direct lift thereof, means for providing an altitude error rate signal corresponding to the algebraic difference between craft vertical speed and a vertical speed reference, means for providing an airspeed error signal corresponding to the algebraic difference of craft airspeed and an airspeed reference, and means for providing a signal representing developed engine torque, said torque having a predetermined maximum value, comprising:

first limiter means for receiving said altitude error rate signal and said engine torque signal and providing an altitude error rate signal limited to a predetermined maximum, and for providing a collective pitch command signal to said collective pitch means,

second limiter means for receiving said airspeed error signal and said engine torque signal and providing an airspeed error signal limited to a further predetermined maximum, and for providing a cyclic pitch command signal to said cyclic pitch means,

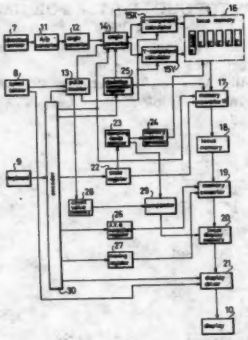
first algebraic summing means responsive to said altitude error rate signal and said collective pitch command signal for providing a vertical rate correction signal representing the difference between commanded torque and developed collective torque to said cyclic pitch means, and

second algebraic summing means for receiving said vertical rate correction signal and said cyclic pitch command signal and conveying the sum of said vertical rate correction and cyclic pitch command signals to said cyclic pitch means, so that said cyclic pitch means responds only to said vertical rate correction signal and said direct lift is apportioned between said collective pitch means and said cyclic pitch means when said flight control system demands at least said predetermined maximum engine torque, and said collective pitch means and said cyclic pitch means are independently responsive to said respective altitude error rate and airspeed error signals when said demanded torque is less than said predetermined maximum.

4,628,456
COURSE GUIDANCE SYSTEM

Itaru Hatano, Morioka; Kenji Takahashi, Iwate; Shigeru Hirosawa, Iwate; Mikio Kanda, Iwate; Teruo Mimori; Toshio Sasaki, both of Yokohama; Tadashi Mukai, Tokyo; Tsuneo Takahashi, Saitama; Shinichiro Yasui, Tokyo, and Akira Ichikawa, Saitama, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Aug. 6, 1982, Ser. No. 405,767
Claims priority, application Japan, Aug. 7, 1981, 56-123876
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—449 7 Claims



1. In a course guidance system for a moving body which includes a direction sensor and a speed sensor mounted to the moving body, a display, a map displayed on said display, and a display information processing unit including position calculating means for periodically deriving the coordinates of the positions of the moving body relative to a predetermined reference position on said map based upon the outputs of said direction and speed sensors, a locus memory for sequentially storing locus data corresponding to the derived coordinates of positions traversed by the moving body from the reference position, and means including a locus display memory for storing and plotting a course locus corresponding to the locus data on the display in registration with said map,

the improvement wherein said display information processing unit further comprises:

a keyboard for inputting linear displacement and rotation data to said processing unit indicative of a desired adjusting movement of the entire course locus on the display relative to said map;

means for setting the desired scale of the map input through said keyboard and means for selecting the locus data in said locus memory corresponding to the desired map scale; and

means including a memory converter for converting the scale selected locus data from said locus memory in accordance with said linear displacement and rotation data and transferring the converted locus data to said locus display memory.

4,628,457
POSTAL RATE MEMORY MODULE WITH INTEGRAL BATTERY POWER

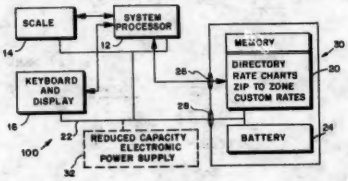
Flavio M. Manduley, Woodbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 19, 1984, Ser. No. 590,670
Int. Cl.[4] G06F *15/21, 9/06*
U.S. Cl. 364—464 17 Claims

1. A memory module comprising;

(a) a postal rate memory storing postal rate information for use in a postal scale having a processor for computing appropriate postage for items to be mailed;

(b) a battery having sufficient capacity to provide at least a substantial portion of the power requirements of such scale until said memory is replaced with an updated postal rate memory;



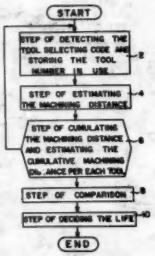
(c) first means for connecting said battery to said memory to provide power to said memory; and,

(d) second means for connecting said memory to said processor so that such processor may access said postal rate information to compute said appropriate postage.

4,628,458
METHOD OF DETECTING LIFT OF TOOL BASED UPON CUMULATIVE MACHINING DISTANCE

Takeshi Ohta, Nishio; Tetsuro Yamakage, Anjoh, and Yoshio Sakakibara, Handa, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 15, 1984, Ser. No. 621,233
Claims priority, application Japan, Jun. 30, 1983, 58-118493
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—474 3 Claims


START
STEP OF DETECTING THE TOOL SELECTING CODE AND STORING THE TOOL NUMBER IN USE
2
STEP OF ESTIMATING THE MACHINING DISTANCE
4
STEP OF CUMULATING THE MACHINING DISTANCE AND ESTIMATING THE CUMULATIVE MACHINING DISTANCE PER EACH TOOL
6
STEP OF COMPARISON
8
STEP OF DECIDING THE LIFE
10
END

1. A method of detecting the life of each of plural tools which are selectively used in accordance with a numerical control program to affect a machining operation on a workpiece in a machine tool, comprising the steps of:

detecting a tool selection code at each execution step of the NC program and storing a tool number of a tool currently in use as derived from the tool selection code;

calculating an actual machining distance for the currently in use tool during machining of the workpiece by the currently in use tool;

accumulating the actual machining distance for each tool by storing the actual machining distance determined in said calculating step for each tool and by adding thereto the actual machining distance calculated for subsequent uses of the respective tool;

comparing the accumulated actual machining distance with a predetermined machining life distance to indicate the life of each tool; and

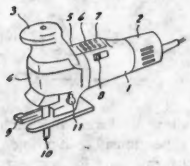
determining the life of each tool based on a result obtained in the comparing step.

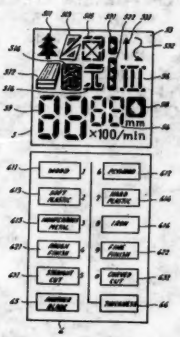
4,628,459

COMPUTERIZED CIRCUIT ARRANGEMENT FOR JIG SAW

Shigeru Shinohara; Shun Suzuki, both of Katsuta, and Tatsuo Innami, Mito, all of Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Mar. 7, 1984, Ser. No. 586,925
Claims priority, application Japan, Mar. 8, 1983, 58-37975
Int. Cl.[4] G06F 15/46
U.S. Cl. 364—475 9 Claims





1. A circuit arrangement for an electrical jig saw of the type arranged such that a replaceable blade is driven by an electrical motor so as to move along a locus selected from a plurality of orbital modes, comprising:

(a) first means for inputting information including the sort of the material of a workpiece to be cut, the thickness of the workpiece, desired degree of finish, and the way of cutting;

(b) second means for computing and determining optimum working conditions including an optimum sort of blade, optimum blade strokes, optimum orbital mode, and information as to the necessity of application of coolant oil by using said inputting information;

(c) third means for displaying inputting information from said first means and said optimum working conditions from said second means;

(d) fourth means for detecting the rotational speed of said motor and producing an output signal indicative of the speed measured;

(e) fifth means for producing a control signal by using said output signal from said fourth means and said optimum blade strokes from said second means; and

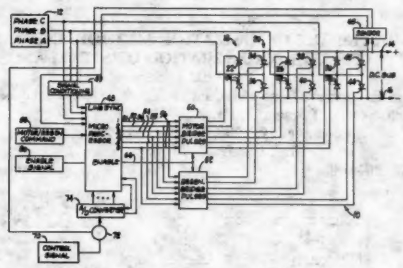
(f) sixth means for controlling the rotational speed of the motor in accordance with said control signal.

4,628,460

MICROPROCESSOR CONTROLLED PHASE SHIFTER

William L. Frederich, Kenosha, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 17, 1982, Ser. No. 419,285
Int. Cl.[4] G06F 15/20; H02P 5/16; H02M 5/42
U.S. Cl. 364—480 10 Claims



1. A method for controlling the conversion of AC electrical energy into DC electrical energy by controllably switching on and off the AC electrical energy source comprising the steps of:

(a) switching the AC electrical energy source on and off for outputting said DC electrical energy;

(b) controlling the switching of the AC electrical energy source in response to the AC electrical energy source;

(c) generating a control signal to control the switching of the AC electrical energy source to output a desired value of DC electrical energy;

(d) sensing said control signal a predetermined number of times during a cycle of the AC electrical energy source;

(e) periodically sensing frequency of said AC electrical energy source;

(f) determining the timing of gating signals for switching said AC electrical energy source on and off responsive to said periodically sensed frequency of said AC electrical energy source and to said control signal to produce a controllable DC electrical energy level; and

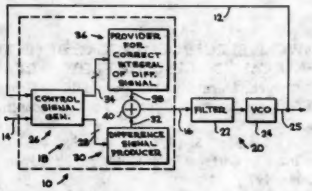
(g) generating said gating signals responsive to said determined timing of gating signals to control said switching of said AC electrical energy source.

4,628,461

PHASE DETECTOR

Neil R. Adams, San Francisco, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 30, 1984, Ser. No. 605,320
Int. Cl.[4] H03L 7/08; H03K 1/17
U.S. Cl. 364—481 19 Claims



1. Apparatus for comparing in real time first signals and second signals, comprising:

(a) means for generating control signals corresponding to the occurrence of the first signals and the occurrence or non-occurrence of the second signals; and

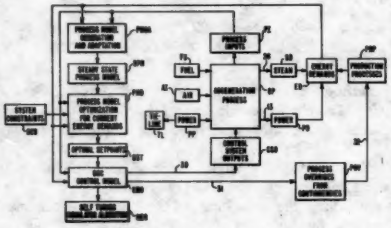
(b) means, responsive to said control signals, for producing an output signal indicating differences between the real time occurrence of the first signals and second signals, said means for producing being operative during the occurrence or non-occurrence of the second signals, said means for producing being operative during the non-occurrence of the second signals while producing no change in the output signal.

4,628,462

MULTIPLANE OPTIMIZATION METHOD AND APPARATUS FOR COGENERATION OF STEAM AND POWER

Richard E. Putman, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 11, 1984, Ser. No. 649,462
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—494 **7 Claims**



1. In a steam and power cogeneration system including a network of fluid flow for passing a demand of steam therethrough at respective higher and lower pressures, embodying at least two steam-to-power converter units operatively connected between corresponding ones of said flow lines at different pressures, and at least two pressure reducing valves operatively connected between corresponding ones of said flow lines at different pressures; the combination of:

means for optimizing power generation by said steam-to-power converter units and for optimizing steam flow through said network in accordance with a predetermined concurrent steam and power demand;

said optimizing means being operable in relation to a plurality of predetermined planes of control each defined by a given status and configuration of said network;

means being provided responsive to a change of actual network status and configuration for selecting optimization by said optimizing means by reference to a new plane of control associated with the new and actual status and configuration of said network;

means for controlling the distribution of steam through said network and concurrent generation of power in accordance with the optimizing results for said new plane of control.

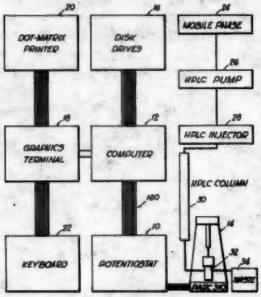
4,628,463

RAPID-SWEEP ELECTROCHEMICAL DETECTOR FOR CHEMICAL ANALYSIS OF FLOW STREAMS

Peter E. Sturrock, Doraville, and Gerald E. O'Brien, Atlanta, both of Ga., assignors to Georgia Tech. Research Institute, Atlanta, Ga.

Filed Mar. 5, 1984, Ser. No. 585,429
Int. Cl.[4] G01N *27/46*; G06F *15/20, 15/46*
U.S. Cl. 364—497 **17 Claims**

9. A data acquisition system comprising computer means and a measuring and control instrument, said instrument including analog circuit means for measuring at least one variable analog function with high sensitivity, logic means for controlling the measuring and control instrument, and an internal data bus as an input to said analog circuit means; an active data bus connected to said computer means; input means for sequentially connecting said active data bus as an input to said internal data bus and for grounding said internal data bus for a



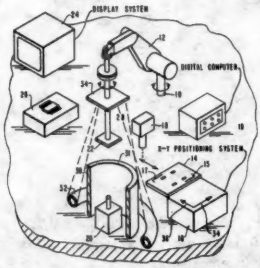
time sufficient to allow measurement with high sensitivity; and output means for repetitiously converting said variable analog function to digital format and for connecting said digital format to said active data bus.

4,628,464

ROBOTIC SYSTEM FOR MOUNTING ELECTRICAL COMPONENTS

William P. McConnell, Columbia, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 540,066, Oct. 7, 1983, abandoned. This application Feb. 25, 1986, Ser. No. 834,494
Int. Cl.[4] G06F *15/00*; B25J *9/00*
U.S. Cl. 364—513 **7 Claims**



1. A system for positioning an electrical component at a predetermined location on a circuit board, comprising:

(a) light producing means for projecting light in an array which is peripherally beyond the periphery of said component to avoid illuminating a bottom side of said component and to illuminate reflecting means spaced above the top side of said electrical component;

(b) visual means positioned to view the bottom side of said component and to produce a high contrast image of the peripheral shadow of said component;

(c) said visual means including means utilizing said high contrast shadow image for generating the angular rotational and position data of said electrical component;

(d) first positioning means utilizing said angular rotational data for rotating said electrical component to a predetermined angular position relative to said circuit board;

(e) second positioning means utilizing said position data for repositioning said electrical component relative to said circuit board in at least first and second directions; and

(f) third positioning means for positioning said electrical component in at least a third direction to position said electrical component at said predetermined location on said circuit board.

4,628,465

METHOD AND APPARATUS FOR MEASURING SHAPE OF INJECTED SUBSTANCE

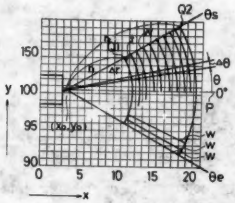
Shinzo Ito, Chita-gun, and Yasuhiro Kaneko, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya City, Japan

Filed Nov. 6, 1984, Ser. No. 668,871

Claims priority, application Japan, Nov. 10, 1983, 58-211589

Int. Cl.[4] G06F *15/626*

U.S. Cl. 364—521 **7 Claims**



1. A method of measuring the shape of an injected substance, comprising the steps of; forming, on a photoelectric converter, an optical image of the substance injected from an opening; scanning the optical image on said photoelectric converter and thereby producing a video signal corresponding to the luminance of said optical image; sampling said video signal in conformity wih plane coordinates on said photoelectric converter and computing a plane luminance distribution function of said optical image; determining a line to cut said optical image, then selecting line elements of a fixed length perpendicular to said line, and computing an average luminance at the individual line elements on the basis of said plane luminance distribution function, thereby obtaining a linear luminance distribution function of said optical image along said cut line; and specifying the shape of said injected substance according to said linear luminance distribution function.

4,628,466

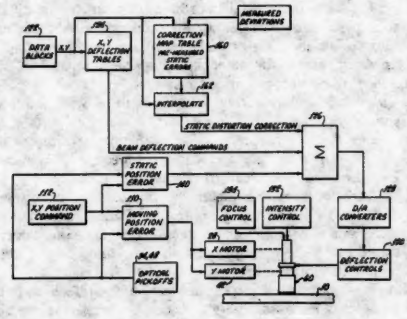
METHOD AND APPARATUS FOR PATTERN FORMING

LaRoy Tymes, San Jose, Calif., assignor to Excellon Industries, Torrance, Calif.

Filed Oct. 29, 1984, Ser. No. 665,930

Int. Cl.[4] G06F *15/60, 15/62*

U.S. Cl. 364—521 **33 Claims**



1. Pattern forming apparatus comprising

an image generator having means for projecting an energy beam to a target area of said image generator, and deflection means for causing said energy beam to scan said target area and form an image thereon,

a support for carrying a medium upon which a pattern is to be formed,

means for mounting said image generator and support for relative motion in a predetermined direction to enable the image generator to move across the surface of said medium, said image generator being positioned with said target area adjacent the surface of said medium,

drive means for relatively moving said image generator and support in said direction in discrete steps to each of a plurality of positions,

means for operating said image generator at individual ones of said positions to cause said energy beam to scan said target area and form a scanned image section, each said scanned image section comprising an individual section of a pattern to be formed on said medium,

sensing means for sensing relative positions of said image generator and support in said direction, and

means responsive to said sensing means for controlling said deflection means to displace an image formed on said target area.

4,628,467

VIDEO DISPLAY CONTROL SYSTEM

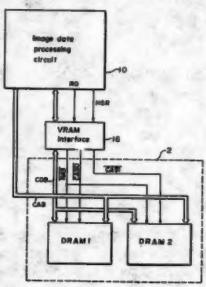
Kazuhiko Nishi; Takatoshi Ishii; Ryozo Yamashita, all of Tokyo; Shigemitsu Yamaoka, Hamamatsu; Takatoshi Okumura, Hamamatsu, and Minoru Morimoto, Hamamatsu, all of Japan, assignors to Ascii Corporation, Tokyo and Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, both of Japan

Filed May 17, 1985, Ser. No. 735,370

Claims priority, application Japan, May 18, 1984, 59-100302

Int. Cl.[4] G06F *15/62*; G09G *1/02, 1/28*

U.S. Cl. 364—521 **3 Claims**



1. A video display control system adapted to be connected to a video display unit for displaying a video image on a screen of the video display unit comprising:

(a) first and second memory means for storing image data representative of the video image, each of said first and second memory means having (i) a plurality of addresses, (ii) a data input/output terminal, (iii) an address input terminal, (iv) row and column address strobe input terminals, (v) row address latch means responsive to a row strobe signal applied to said row address strobe input terminal for latching row address data applied to said address input terminal, and (vi) column address latch means responsive to a column strobe signal applied to said column address strobe input terminal for latching column address data applied to said address input terminal, said row and column address data latched by both of said row and column address latch means determining one of said plurality of addresses with which transfer of data is made through said data input/output terminal, said data input-

/output terminal being in a high-impedance state when no signal is applied to said column address strobe input terminal;

(b) display control means having (i) an address bus connected to both of said address input terminals of said first and second memory means, (ii) a data bus connected to both of said data input/output terminals of said first and second memory means, (iii) access control means for outputting row address data of a selected one of said plurality of addresses onto said address bus and for feeding a row address strobe signal to both of said row address strobe input terminals of said first and second memory means, said access control means subsequently outputting column address data of said selected address onto said address bus and feeding alternatively first and second column address strobe signals to said column address strobe input terminal of said first memory means and said column address strobe input terminal of said second memory means, respectively, whereby said display control means establishing an access to said selected address of each of said first and second memory means so that transfer of data with said selected addresses is effected through said data bus.

4,628,468

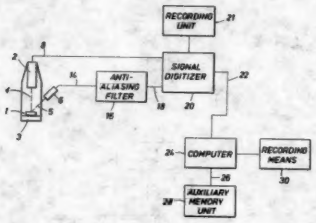
METHOD AND MEANS FOR DETERMINING PHYSICAL PROPERTIES FROM MEASUREMENTS OF MICROSTRUCTURE IN POROUS MEDIA

Arthur H. Thompson; Alan J. Katz, and Christine E. Krohn, all of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Apr. 13, 1984, Ser. No. 599,842

Int. Cl.[4] H01J *37/26, 37/29;* G01V *1/40*

U.S. Cl. 364—556 **43 Claims**



10. A method for determining pore-dependent properties of a microporous rock, comprising the steps of:

(a) scanning the surface of a sample of the rock with a microscope operated at a first selected magnification to generate a microscope output signal indicative of geometric features of the sample intersecting a path on the surface;

(b) generating from the microscope output signal a feature size distribution signal indicative of the number of geometric features resolved by the microscope which intersect the path and which have size less than a selected fraction of the full-scale image size associated with said first selected magnification;

(c) repeating steps (a) and (b), operating the microscope used during each repetition at a selected magnification different from each magnification used in performing a previous repetition so as to generate during each repetition a microscope output signal associated with the selected magnification used during such repetition and a feature size distribution signal associated with the selected magnification used during such repetition; and

(d) determining from the generated feature size distribution signals the fractal dimensionality, D, of the sample pore space, from which the rock porosity, ϕ, is determined by the relation $\phi=(l_1/l_2)^{3-D}$, where l_1 is the minimum length at which the sample exhibits self-similarity and l_2 is the maximum length at which the sample exhibits self-similarity.

4,628,469

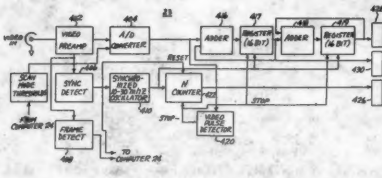
METHOD AND APPARATUS FOR LOCATING CENTER OF REFERENCE PULSE IN A MEASUREMENT SYSTEM

Steven J. White, Seattle, Wash., assignor to Technical Arts Corporation, Seattle, Wash.

Division of Ser. No. 426,840, Sep. 29, 1982, Pat. No. 4,498,778, which is a continuation-in-part of Ser. No. 249,131, Mar. 30, 1981, abandoned. This application Oct. 17, 1984, Ser. No. 661,780

Int. Cl.[4] G01B *11/24;* G02B *26/10*

U.S. Cl. 364—560 **5 Claims**



1. In a method for determining spatial coordinates of a workpiece, the steps comprising:

(a) illuminating said workpiece with a planar source of light;

(b) electronically viewing the intersections of the planar source of light and said workpiece from a known location spaced apart from said workpiece;

(c) scanning electronic images formed by said electronic viewing along a plurality of scan lines, in which the scanning of each line produces a reference pulse corresponding to the location at which the planar light intersects said workpiece;

(d) determining the centroid of the reference pulse on at least one of said scan lines by the substeps of:

(i) sampling a pulse signal representing said reference pulse;

(ii) digitizing said samples to generate digital values representative of the magnitude of said pulse samples;

(iii) performing a first integration by sequentially adding said digital values to produce a first sum signal;

(iv) performing a second integration by adding intermediate sums associated with said substep of sequentially adding said digital values to produce a second sum signal; and

(v) dividing said second sum signal by said first sum signal to produce an offset distance representing an offset distance by which the centroid of said pulse signal precedes the location at which the last sample of said pulse signal was taken; and

(e) calculating the spatial coordinates of said point on the workpiece using the centroid of said reference pulse and said known location of said step of electronic viewing.

4. In an apparatus for determining spatial coordinates of a workpiece, the combination comprising:

(a) means for illuminating said workpiece with a planar source of light;

(b) means for electronically viewing the intersections of the planar source of light and said workpiece from a known location spaced apart from said workpiece;

(c) means for scanning electronic images formed by said electronic viewing along a plurality of scan lines, in which the scanning of each line produces a reference pulse corresponding to the location at which the planar light intersects said workpiece;

(d) means for determining the centroid of the reference pulse on at least one of said scan lines comprising the subcombination of:

(i) means for sampling a pulse signal representing said reference pulse;

(ii) means for digitizing said samples to generate digital values representative of the magnitude of said pulse samples;

(iii) means for performing a first integration by sequentially adding said digital values to produce a first sum signal;

(iv) means for performing a second integration by adding intermediate sums associated with said means for performing said first integration to produce a second sum signal; and

(v) means for dividing said second sum signal by said first sum signal to produce an offset distance signal representing an offset distance by which the centroid of said pulse signal precedes the location at which the last sample of said pulse signal was taken; and

(e) means for calculating the spatial coordinates of said point on the workpiece using the centroid of said reference pulse and said known location of said means for electronic viewing.

4,628,470

APPARATUS AND METHOD FOR GENERATING A PICTORIAL DISPLAY ON A MEASURING INSTRUMENT DURING A METERING PROCESS

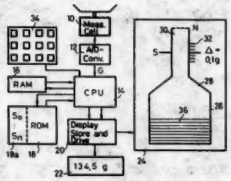
Arthur Baumann, Bertschikon, Switzerland, assignor to Mettler Instruments AG, Greifensee-Zurich, Switzerland

Filed Jan. 9, 1984, Ser. No. 569,175

Claims priority, application Switzerland, Jun. 10, 1983, 3197/83

Int. Cl.[4] G09F *9/32*; G06F *15/20*

U.S. Cl. 364—567 **20 Claims**



1. Method for guiding an operator metering a substance from a starting value to a desired value on a measuring instrument having a display unit, comprising the steps of

creating from display element means a clearly defined outline of a container on said display unit;

creating weight signals indicative of the then-present weight of said substance on said measuring instrument;

creating weight indicating control signals in response to said weight signals;

said weight indicating control signals displaying any change in the contents of said container on said display unit from said starting value to said desired value at a first image rate of change relative to the rate of change of said substance on said measuring instrument at the start of said metering, and at a second image rate of change relative to the rate of change of said substance before said desired value is reached.

4,628,471

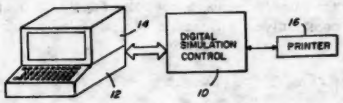
DIGITAL SYSTEM SIMULATION METHOD AND APPARATUS HAVING TWO SIGNAL-LEVEL MODES OF OPERATION

Donald Schuler, Wayland, and Mahesh Doshi, Framingham, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Feb. 2, 1984, Ser. No. 576,423

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—578 **9 Claims**



1. Apparatus for simulating the behavior of a digital circuit, the digital circuit having a plurality of connected circuit elements, the apparatus comprising

means for defining inputs to said circuit elements,

means for defining output signal levels for outputs of said circuit elements based upon a functionally dependent relationship between said inputs and outputs, and

means for evaluating said circuit element input and output relationships for performing gate level simulation and switch level simulation,

said evaluation means operating

in a first lower signal-level simulation mode for gate level simulation, and

in a second higher signal-level simulation mode for switch level simulation,

whereby said apparatus simulates said digital circuit behavior in either a lower level or a higher level simulation mode depending upon the class of circuit element for which a said input is being received.

4,628,472

BINARY MULTIPLIER USING TERNARY CODE

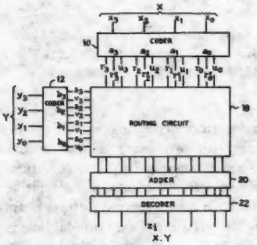
Thierry Fensch, Grenoble, France, assignor to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux-Efcis[2], Grenoble, France

Filed Nov. 18, 1983, Ser. No. 553,488

Claims priority, application France, Nov. 26, 1982, 82 19921

Int. Cl.[4] G06F *7/52*

U.S. Cl. 364—759 **8 Claims**



3. A binary multiplier circuit for receiving in the form of logic electric signal a first binary number X and a second binary number Y, so as to supply in the form of logic electric signal the product of these two numbers, said multiplier circuit comprising a coder for converting n binary signals y_j(j=0 to n−1) representing number Y into n pairs of binary signals (s_j,v_j), each pair representing one coefficient b_j(j=0 to n−1), where b_j can be 0, 1 or −1 and where one signal (s_j) of the pair represents the sign of b_j and the other signal (v_j) of the pair

represents the module of b_j, where the product of two consecutive coefficients b_j and b_{j-1} is zero, and where the coefficients b_j are such that

$$Y=b_{n-1}2^{n-1}+b_{n-2}2^{n-2}+\ldots b_12^1+b_0,$$

said multiplier circuit further comprising a second coder for converting m binary signals x_i representing number X into m pairs of binary sigals (r_i,u_i), each pair representing one coefficient a_i(i=0 to m−1), where a_i can be 0, 1 or −1 and where one signal r_i of the pair represents the sign of a_i and the other signal u_i of the pair represents the module of a_i, where the product of two consecutive coefficients a_i and a_{i-1} is zero, and where the coefficient a_i are such that

$$X=a_{m-1}2^{m-1}+a_{m-2}2^{m-2}+\ldots a_12^1+a_0$$

said multiplier further comprising a routing circuit and a binary adder stage, said routing circuit receiving the outputs of said second coder and the routing circuit being controlled by the outputs of said first coder, and said adder stage receiving outputs from the routing circuit.

4,628,473

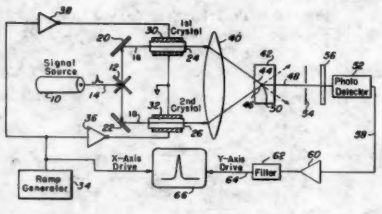
SYSTEM FOR AUTOCORRELATING OPTICAL RADIATION SIGNALS

James A. Weaver, Palo Alto, Calif., assignor to Cooper Lasersonics, Inc., Santa Clara, Calif.

Filed Jul. 27, 1984, Ser. No. 635,007

Int. Cl.[4] G06G 7/19

U.S. Cl. 364—822 **28 Claims**



1. A system for autocorrelating an optical radiation signal comprising means for producing a first optical beam and a second optical beam from said optical radiation signal; beam delay means for selectively producing a relative time adjustment between said first and second optical beams; and means for determining the product of said optical beams over a range of time adjustments between said optical beams to provide a measurement of said optical radiation signal, said beam delay means comprising at least one electro-optic crystal, means for selectively applying an electric field across said crystal to vary the index of refraction of said crystal, and means for directing at least one of said optical beams through said electro-optic crystal before determining the product of said optical beams such that selected variations in the electric field across said crystal produce selected time adjustments between said optical beams.

4,628,474

MODIFIED DUOBINARY FILTER USING SAW TECHNIQUE

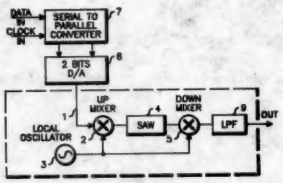
Salomon Serfaty, Doar Gaash, and Mordechay Cohen, Giv-'Atayim, both of Israel, assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 25, 1984, Ser. No. 613,924

Claims priority, application United Kingdom, May 25, 1983, 8314478

Int. Cl.[4] G06G 7/00

U.S. Cl. 364—825 **7 Claims**



1. A modified-duobinary filter arrangement for filtering data symbols spaced at time intervals T, comprising:

a first mixer for translating the frequency of an analogue data input signal in a first direction to provide a data modulated intermediate frequency (I.F.) signal;

a surface acoustic wave filter for filtering the I.F. signal, and

a second mixer for translating the frequency of the filtered I.F. signal in a second direction opposite to the first direction;

wherein the surface acoustic wave filter has a transfer function response, H(f), as a function of frequency, f, given by:

$$H_2{}^T\mathrm{IF}(f)=H_2{}^T(f+f_o)+H_2{}^T(f-f_o)$$

where:

$$H_2{}^T(f)=\frac{H^T(f)}{H_1(f)},$$

f_o is the I.F. frequency, and

$$H_1(f)=\frac{T\sin(\pi fT)}{\pi fT};$$

where:

T is the symbol time interval, and

$H^T(f)$ is a truncated version of a function H(f) whose time-domain response h(t) is given by:

$$h(t)=f_1\left[\frac{\sin 2\pi f_1(t+T)}{2\pi f_1(t+T)}-\frac{\sin 2\pi f_1(t-T)}{2\pi f_1(t-T)}\right]$$

where:

$f_1=1/2T$,

and the truncation is defined by:

$$h^T(t)=\begin{cases}h(t) & -\tau/2<t<\tau/2,\\ 0 & \text{elsewhere,}\end{cases}$$

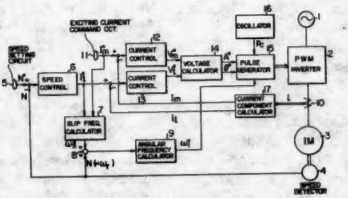
where τ is the truncation interval.

4,628,475

PULSE WIDTH MODULATION PULSE GENERATOR

Noboru Azusawa, and Hisayoshi Shiraishi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 3, 1984, Ser. No. 576,720
Claims priority, application Japan, Feb. 4, 1983, 58-16039
Int. Cl.[4] G06G 7/16; H02P 13/18, 8/00; H02M 7/48
U.S. Cl. 364—851 4 Claims



1. A pulse width modulation pulse generator comprising:

modulating wave generating means for generating a sine wave modulating signal which forms a fundamental component of an output voltage of a pulse width modulation inverter;

carrier generating means for generating a sine wave carrier signal which is at a frequency n times as high as a frequency of said sine wave modulating signal and synchronized with said sine wave modulating signal; and

comparison means connected to said modulating wave generating means and said carrier generating means for comparing said sine wave modulating signal with said sine wave carrier signal to generate a pulse width modulation pulse.

4,628,476

COMPLETING AN INCOMPLETE TRIP IN AN ELECTRONIC POSTAGE METER

Edward C. Duwel, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

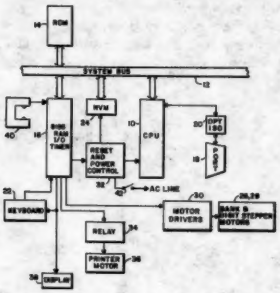
Filed Dec. 8, 1982, Ser. No. 447,918
Int. Cl.[4] G06F 15/20
U.S. Cl. 364—900 10 Claims

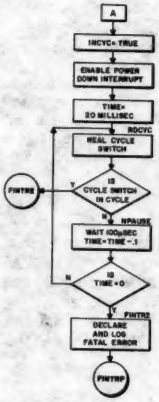
1. A method for completing an incomplete trip in an electronic postage meter, comprising the steps of:

reading the state of a bistable member after the trip cycle has commenced;

setting a fatal error if the bistable member is in its Home state prior to completion of the trip cycle;

energizing a drive motor to try to complete the trip cycle;





reading the state of the bistable member;

de-energizing the drive motor after a selected maximum period of time.

4,628,477

PROGRAMMABLE PUSH-POP MEMORY STACK

James L. Burrows, Merrimack, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 17, 1983, Ser. No. 542,326
Int. Cl.[4] G06F 12/00, 9/00
U.S. Cl. 364—900 5 Claims

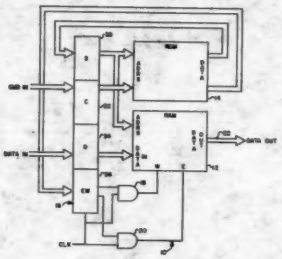
1. A data stack for sequentially receiving data from a data processing system including means for transmitting address signals, means for transmitting data and means for transmitting commands in synchronism with the data, the data stack storing the data and transmitting the stored data in a selected one of a FIFO and a LIFO sequence in response to commands from the data processing system, the data stack comprising:

means for generating timing signals;

a random access memory connected to the data transmitting means and having a plurality of addressable storage locations, means for receiving address signals and data signals and for storing the received data signals in a storage location identified by the address signals in response to the receipt of a write enabling signal, and means for transmitting contents of a storage location identified by the ad-

dress signals in response to the receipt of a read enabling signal;

state means connected to the timing signal generating means, the command transmitting means and the random access memory for generating read and write enabling signals and address signals identifying a storage location in the random access memory in response to each command in synchronism with the timing signals, the address signals being transmitted to the random access memory address



signal receiving means and the state means, the state means generating address signals in response to the commands and address signals transmitted by the state means at the next succeeding timing signal for reading information from the random access memory means in a selected one of a FIFO and a LIFO sequence; and

means for selectively coupling address signals from the data processing system or address signals from the state means to the random access memory.

4,628,478

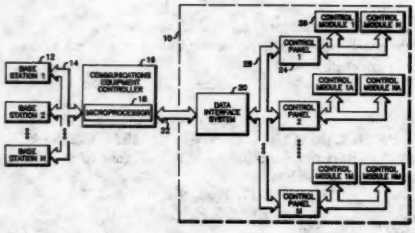
REMOTE DATA CONTROLLER FOR A COMMUNICATION SYSTEM

James A. Henderson, Jr., Streamwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 7, 1983, Ser. No. 511,611

Int. Cl.[4] G06F *13/00, 11/00*

U.S. Cl. 364—900 **9 Claims**



9. In a communications system including communications equipment having operator selectable functions and providing status signals representative of the operation condition of features of the communication equipment and means for controlling the communications equipment, the improvement in said controlling means comprising:

control modules each including means for receiving indicia data representative of the operational condition of the features of the communications equipment and providing indicia representative thereof, and means for generating data for controlling the functions selected on the communications equipment;

at least two control panel means each coupled to a predetermined plurality of said control modules for communicating digitally with each of said plurality, each of said control panel means including a panel selector having a predetermined address, and a module selector having a predetermined address for selecting one of the control modules associated with a control panel means;

data interface circuit means coupled between the communications equipment and each of said control panel means for communicating digitally with each of the control panel means, said data interface circuit means including a microprocessor means for selecting one of said panel means and one of its associated control modules via addressing the corresponding panel selector and module selector, writing indicia data representative of said status signal to the selected control module via the selected control panel means, and for reading said control data generated by said generating means as coupled by said control panel means; and

data transfer circuit means for controlling the transfer of data from said control modules to said microprocessor means and for controlling the transfer of data from said microprocessor means to said control modules, said data transfer circuit means including a single clock means for generating clock pulses which are coupled to said control panel means and control modules, said clock means providing the sole source of clock pulses for the control panel means and control modules.

4,628,479

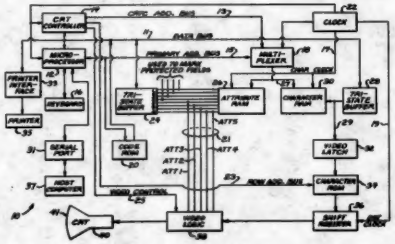
TERMINAL WITH MEMORY WRITE PROTECTION

Arthur N. Borg, Lake Forest, and Giora Bar-Hai, Oak Park, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 30, 1984, Ser. No. 646,275

Int. Cl.[4] G06F *12/16*

U.S. Cl. 364—900 **14 Claims**



1. A memory protection system for use in a terminal controlled by a signal processor and including a video display, said system comprising:

first memory means having a plurality of first memory areas accessed by respective memory addresses for storing data therein;

a first data bus coupling said signal processor to said first memory means for permitting said signal processor to write data into said first memory areas and to read data therefrom;

a second data bus coupling said first memory means to said video display for providing the data read from said first memory means to said video display for display thereon; and

second memory means coupled to said signal processor by means of said first data bus and to said video display, said second memory means having a plurality of second memory areas each corresponding to a respective first memory area of said first memory means and having stored therein one of a plurality of display attribute words, wherein said display attribute words are read by said signal processor and provided to said video display and to said first mem-

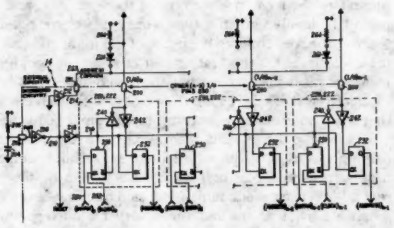
ory means for controlling the display of said data on the video display and wherein each of said display attribute words includes a memory protect portion for inhibiting said signal processor from writing data into a first memory area corresponding to a second memory area associated with said display attribute word.

4,628,480

ARRANGEMENT FOR OPTIMIZED UTILIZATION OF I/O PINS

William M. Floyd, Livonia, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Oct. 7, 1983, Ser. No. 540,573
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—900 9 Claims



1. An arrangement for the input of address data to an integrated circuit via the same input/output (I/O) terminal pins utilized for the transfer of data comprising:

an integrated circuit having an internal/external interface and including a plurality of separate first I/O pins at the circuit internal/external interface, each said first I/O pin having both output circuit means and address circuit means connected thereto and positioned internally of said interface;

means for applying a first logic level to each of said first I/O pins via respective resistance means;

a further I/O pin at said interface;

a common conductor being connected to said further I/O pin and being positioned externally of said interface;

one or more unidirectionally conducting address means positioned externally of said interface and connected individually at one same end to respective selected ones of said first I/O pins in accordance with a desired address and connected at the other end to said common conductor;

level control means connected to said further I/O pin for placing said further I/O pin and common conductor at either a high impedance level or at a second logic level different than the first logic level in response to a gate signal;

means for generating a said gate signal and coupling said gate signal to said level control means such that said common conductor is temporarily placed at the second logic level which is required for said unidirectionally conducting means to conduct only for input of address data bits to the integrated circuit; and

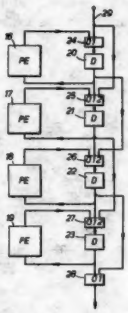
each said address circuit means storing a respective said address bit having been input.

4,628,481

DATA PROCESSING APPARATUS

Stewart F. Reddaway, Baldock, Great Britain, assignor to International Computers Limited, London, England

Filed Dec. 6, 1984, Ser. No. 678,688
Claims priority, application United Kingdom, Jan. 24, 1984, 8401805
Int. Cl.[4] G06F *13/38*
U.S. Cl. 364—900 6 Claims



1. Data processing apparatus comprising a plurality of data processing elements each of which has an associated data rgister for receiving output data from that element, each data register having an associated multiplexing circuit connected to a data input of the data register, the data processing elements and their associated data registers being logically arranged in rows and columns, wherein each column of the data registers includes:

(a) a first set of connection paths each of which connects a data output of a respective one of the data registers to a first input of the multiplexing circuit associated with the next data register in the same column, and

(b) a second set of connection paths, distinct from the first set of connection paths, each of the second set of connection paths connecting the data output of a respective one of the data registers to a second input of the multiplexing circuit associated with the next-but-one data register in the same column,

whereby the multiplexing circuits are selectively operable to connect together either

(i) the even-numbered registers in each column,

(ii) the odd-numbered registers in each column, or

(iii) all the registsers in each column,

thereby forming a serial shift path in each column allowing data either from the even rows, the odd rows, or all the rows to be shifted out, one row at a time.

4,628,482

COMMON MEMORY CONTROL SYSTEM WITH TWO BUS MASTERS

Tsuguji Tachiuchi, Odawara, and Toyota Honda, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 3, 1983, Ser. No. 491,227
Claims priority, application Japan, May 7, 1982, 57-75208
Int. Cl.[4] G06F *13/16*
U.S. Cl. 364—900 11 Claims

1. A data processing apparatus for controlling accessing of a memory comprising:

memory means having a number of address locations;

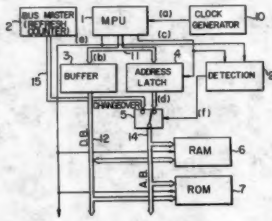
an address bus and a data bus;

microprocessing means, operating in time with successively received clock signals and connected to said memory means via said data bus, for generating an address signal during a first period of at least one clock signal to specify one of said address locations in said memory means and

for performing data transfer on said data bus between said microprocessing means and the address location in said memory means specified by said address signal during a second period of at least one clock signal following said first period;

detection means for detecting said second period during which said data transfer is to be effected on said data bus between said microprocessing means and the specified address location in said memory means;

bus master means separate from said microprocessing means for generating an address signal to specify an address location in said memory means for accessing said memory means; and



bus control means connected to said microprocessing means, said bus master means and said address bus and responsive to the output of said detection means for supplying said address signal from said microprocessing means to said memory means only during said second period of data transfer between said microprocessing means and said memory means, and for supplying said address signal from said bus master means to said memory means to specify a different address location of said memory means whenever no data transfer is being effected between said microprocessing means and said memory means and at least during said first period.

4,628,483

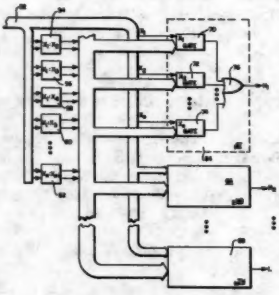
ONE LEVEL SORTING NETWORK

Raymond J. Nelson, 2400 Demington Dr., Cleveland, Ohio 44106

Division of Ser. No. 384,483, Jun. 3, 1982, which is a continuation of Ser. No. 73,640, Sep. 10, 1979, abandoned. This application Sep. 19, 1984, Ser. No. 652,304

Int. Cl.[4] G06F *7/00*

U.S. Cl. 364—900 **3 Claims**



1. A sorting circuit for sorting three input values into first through third ascendingly ordered output values, said input values being represented by three input sequences, respectively, siad first through said third output values being represented by first through third output sequences, respectively, each of said input and said output sequences being a time scquence having a prescribed number of binary bits arranged from the most significant bit to the least significant bit, said input and said output sequences thereby having corresponding bits each binary bit having either of a logic "0" and a logic "1" level at a time, said sorting circuit comprising:

state specifying means for specifying any one of an initial state, six first-level states, and six second-level states at a time, each first-level state being accompanied by two second-level states with said two second-level states assigned to two first-level states including said each first-level state, respectively, so that each second-level state may indicate a particular order among said input values, said initial state being a state in which the order of said input values is not yet definite, each first-level state being another state in which the order is determined for only one input value, each of the two second-level states accompanying the last-mentioned first-level state being still another state in which the order is determined for two input values except for said only one input value;

means for resetting said state specifying means into said initial state;

checking and driving means coupled to said state specifying means for checking three corresponding bits of the respective input sequences from time to time to drive, when only one bit is checked to have one of the logic "0" and the logic "1" levels with the two binary bits corresponding thereto checked to have the other of the logic "0" and the logic "1" level for the first time after said state specifying means is reset into said initial state, said state specifying means from said initial state to one of said first-level states that is predetermined according to the input sequence in which said only one bit is present, said checking and driving means subsequently driving said state specifying means from said one first-level state to one of the two second-level states accompanying said one first-level state when a particular bit and the binary bit corresponding thereto of two input sequences except for the input sequence in which said only one bit is present are checked to have a predetermined one and the other of the logic "0" and the logic "1" levels, respectively, for the first time after said state specifying means is driven to said one first-level state; and

an output circuit coupled to said state specifying means for arranging said input sequences into said first through said third output sequences accoraing to said initial state, said one first-level state, and said one second-level state.

4,628,484

SIGNAL AND POWER APPLYING UNIT FOR MEMORY CASSETTES

Seiichi Hattori, Tokyo, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

Continuation of Ser. No. 452,140, Dec. 22, 1982, abandoned. This application Jul. 22, 1985, Ser. No. 757,207

Claims priority, application Japan, Dec. 29, 1981, 56-213941

Int. Cl.[4] G11C *5/04, 11/34*

U.S. Cl. 365—52 **5 Claims**

1. A device for applying an interface signal and a power supply voltage to a semiconductor memory cassette through an adapter, comprising:

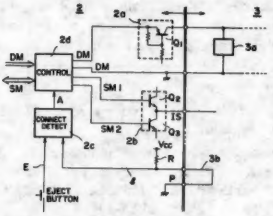
first means for generating a connection signal when the memory cassette and the adapter are interconnected;

second means, separate from said first means, for generating a withdrawal signal when the memory cassette is disconnected from the adapter;

connection detecting means, operatively connectable to said first and connected to said second means and responsive to said connection and withdrawal signals, for producing first and second operation permit signals, respectively; and

control means, operatively connected to said connection

detection circuit and responsive to said first operation permit signal, for applying the power supply voltage to the memory cassette through the adapter and rendering the interface signal active, and also responsive to said



second operation permit signal for switching off the power supply voltage and rendering the interface signal inactive, thereby preventing erasure in the semiconductor memory cassette.

4,628,485

MAGNETO-OPTICAL RECORDING MEDIUM

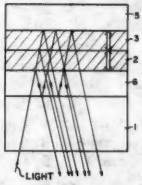
Fujio Tanaka, Tanashi; Yasuyuki Nagao, Yokohama, and Nobutake Imamura, Kamakura, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1984, Ser. No. 631,580

Claims priority, application Japan, Jul. 20, 1983, 58-130771

Int. Cl.⁴ G11B *23/00*; G11C *11/42*

U.S. Cl. 365—122 **3 Claims**



1. A magneto-optical recording medium comprising: a recording layer of a magnetic thin film low in the Curie temperature or magnetic compensation temperature and high in coercive force and having an easy axis of magnetization in a direction perpendicular to the film surface; a reproducing layer disposed adjacent the recording layer and large in the magnetic Kerr rotation angle and having an easy axis of magnetization in a direction perpendicular to the film surface; a transparent substrate disposed on the side of incidence of light; a reflecting metal layer for reflecting incident light having entered from the side of the transparent substrate passed through the recording layer and the reproducing layer; and a dielectric layer disposed at least on the side of the transparent substrate with respect to the recording layer and the reproducing layer and effective to cause multiple light reflections by the reproducing layer or the recording layer so that Kerr rotation and Faraday rotation are increased.

4,628,486

MOS DYNAMIC RANDOM ACCESS MEMORY

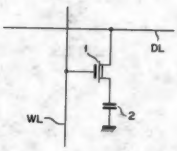
Koji Sakui, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

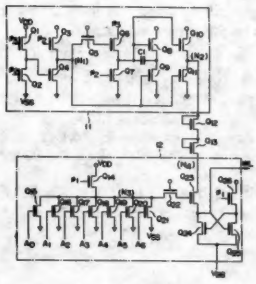
Filed Dec. 13, 1984, Ser. No. 681,024

Claims priority, application Japan, Mar. 31, 1984, 59-63533

Int. Cl.⁴ G11C *11/24, 8/00*

U.S. Cl. 365—149 **1 Claim**





1. A MOS-dynamic random access memory, comprising:
a semiconductor substrate;
a memory array formed of a plurality of memory cells arranged in a matrix on the substrate, each of said memory cells including a memory capacitor and a switching MOSFET having a gate, a source, a drain, and a channel region doped with impurities of a conductivity type opposite to that of the substrate;
a plurality of word lines formed on the substrate each connected in common with the gates of the switching MOSFETs of a plurality of said memory cells arranged along each corresponding row of said memory array;
a decoder formed on the substrate for selectively driving said plurality of word lines, including an output MOSFET and a flip-flop connected to the source of the output MOSFET, wherein a substrate bias voltage delivered from a back-gate bias circuit is used as a reference potential of said flip-flop;
a clock generator formed on the substrate for controlling the operating timing of the decoder; and
a level shift circuit formed on the substrate connected between an output of said clock generator and the drain of the output MOSFET of said decoder.

4,628,487

DUAL SLOPE, FEEDBACK CONTROLLED, EEPROM PROGRAMMING

Michael C. Smayling, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 14, 1984, Ser. No. 640,721

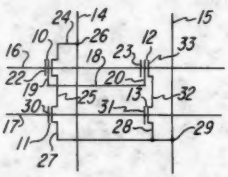
Int. Cl.⁴ G11C *11/34*

U.S. Cl. 365—185 **19 Claims**

1. A method of programming a floating gate memory cell of

the type having a thin-oxide area between a floating gate and another electrode, comprising the steps of:

applying a voltage to said memory cell to produce an electric field across said thin-oxide area, and increasing said voltage substantially linearly as a function of time at a first



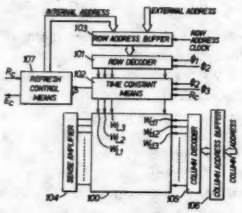
rate, abruptly changing the rate of increase of said voltage to a second rate lower than said first rate and then continuing to increase said voltage substantially linearly, then again abruptly ceasing said increase of voltage and thereafter maintaining said voltage constant at a given maximum level for a selected time.

4,628,488

SEMICONDUCTOR MEMORY DEVICE WITH A REFRESH MECHANISM

Koji Saku, Kawasaki, and Fumio Horiguchi, Itabashi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 27, 1983, Ser. No. 565,815
Claims priority, application Japan, Dec. 27, 1982, 57-226705
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—222 **10 Claims**



1. A semiconductor memory device with a refresh mechanism comprising:

a plurality of memory cells each consisting of one transistor and one capacitor which are integrated on a semiconductor substrate;

a plurality of word lines for addressing said memory cells;

a plurality of digit lines for reading and/or writing the data of said memory cells;

an access control means for accessing said memory cells by selecting said word lines;

a refresh control means for successively selecting said word lines connected to each of said memory cells and refreshing said memory cells word line by word line in a refresh period; and

a time constant means connected to each of said word lines which is activated whenever the word line connected to it is selected during an access period and which supplies a "refresh not required" signal until a first predetermined time has elapsed to said refresh control means in said refresh period, wherein

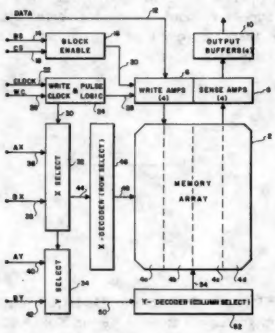
said refresh control means includes a pulse generator, a row address counter for successively selecting said word line by pulse signals from said pulse generator, a first circuit means for detecting the data in said row address counter and emitting a pulse signal indicating the end of said refresh period when said data indicates that the maximum row address has been exceeded, and a second circuit means for incrementing said row address counter by 1 when said "refresh not required" signal is supplied from said time constant means and stopping an incrementation of said row address counter for a second predetermined time period when said "refresh not required" signal is not supplied from said time constant means.

4,628,489

DUAL ADDRESS RAM

Richard H. Ong, Phoenix; Peter C. Economopoulos, Scottsdale, and Russell W. Guenthner, Glendale, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Oct. 3, 1983, Ser. No. 538,387
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—230 **4 Claims**



1. A memory unit for a digital computer comprising:

a memory array of a plurality of individual memory cells;

addressing means for selectively addressing individual ones of said cells in said memory array;

means for applying simultaneously a first and a second address signal to said addressing means;

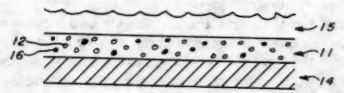
a clock signal means for establishing a cyclic clock signal, each of said cyclic clock signals having two half cycle phases;

said addressing means including selecting means, said selecting means including a first input amplifier stage connected to receive and respond to said first address signal and a second input amplifier stage connected to receive and respond to said second address signal; said first input amplifier stage comprising a first differential amplifier for comparing said first address signal with a first fixed reference signal, and said second input amplifier stage comprising a second differential amplifier for comparing said second address signal with said first fixed reference signal; and an energizing current steering circuit connected to be responsive to said cyclic clock signals, said steering circuit comprising a differential amplifier for comparing said cyclic clock signal with a second referece signal, said steering circuit differential amplifier defining a first and a second current path, an energizing current source means connected to said steering circuit differential amplifier, said steering circuit responsive to the half cycle phases of each cyclic clock signal to steer energizing current from said current source means through said first or second path to selectively energize the first or second differential amplifiers of said first or second input amplifier stages, whereby said memory array may be addressed and accessed during each half cycle phase of a cyclic clock signal.

4,628,490
WIDEBAND SONAR ENERGY ABSORBER

Irvin R. Kramer, Baltimore, and Wayne T. Reader, Mourovia, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 24, 1985, Ser. No. 813,310
Int. Cl.[4] E04B *1/82*
U.S. Cl. 367—1 **6 Claims**

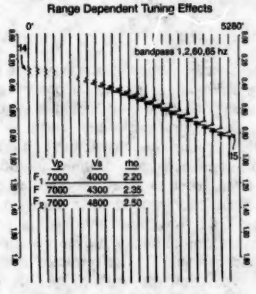


1. An acoustic energy absorbing material means comprising:
a non-conducting elastomeric matrix means having particles selected from the group consisting of piezoelectric and magnetostrictive material disposed therein for converting incident soundwave energy into heat,
a corrosion resistant means coated onto the particles for matching the properties of the piezoelectric and magnetostrictive particles for optimizing energy absorption of sonar waves of predetermined frequency,
said elastomeric matrix means designed so as to have a Poisson's ratio of about 0.5 for effectively utilizing all particles so the incident soundwaves are applied to the particles as a hydrostatic stress distribution,
said acoustic energy absorbing material means consisting of a plurality of thin layers of the elastomeric matrix means and having high energy absorption per unit volume for providing a slight impedance mismatch between successive layers thus absorbing the predetermined energy of the soundwaves.

4,628,491
TIME VARIANT FILTER FOR RANGE DEPENDENT TUNING

John H. Bodine, and Jonathan Bork, both of Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed Mar. 30, 1984, Ser. No. 595,119
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—45 **20 Claims**

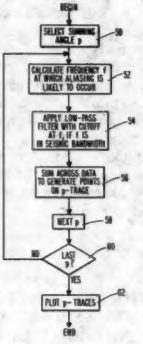


1. A method of seismic exploration including acquiring seismic response data from seismic signals generated by a plurality of seismic sources and seismic receivers having at least one dimension for resolving seismic signal amplitude variations as a function of range comprising the steps of:
sorting the seismic response data into unstacked common depth point gathers of seismic signals;
specifying range separating each seismic source and each seismic receiver in a common depth point array of seismic sources and seismic receivers;
impressing a bandpass filter upon the seismic signal from each seismic receiver having a bandpass frequency dependent upon the range separating one seismic receiver from the seismic source initiating the seismic signal in a common depth point array to resolve seismic signal amplitude variations as a function of range in a common depth point gather of seismic signals.

4,628,492
METHOD OF AVOIDING ALIASING IN SLANT STACKING OF SEISMIC DATA

Randy A. Winney, Garland, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 11, 1984, Ser. No. 569,820
Int. Cl.[4] G01V *1/32*
U.S. Cl. 367—63 **2 Claims**



1. The method of transforming seismic data traces recorded in x-t space to τ-p space comprising the steps of:
selecting an initial summing angle p;
identifying frequency components of said input data liable to be aliased with respect to a given angle p, said frequency components of said data liable to be aliased are identified by the equation

$$f=[2g|p-(x/tv^2)|]^{-1}$$

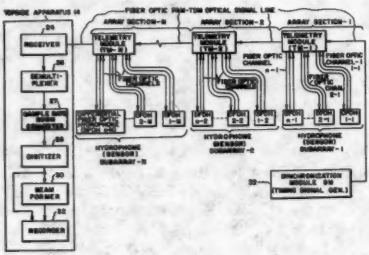
f is frequency component of the data liable to be aliased,
p is the summing angle,
g is the trace spacing,
x is the source to receive distance at which the seismic data is taken,
t is time measured from the input of seismic energy to the earth, and
v is velocity of the seismic energy through the earth;
filtering said frequency components liable to be aliased prior to summation to generate points for said p trace;
summing individual elements of seismic traces in x-t space, said elements of said traces lying along a line making the angle p with respect to the horizontal to generate points on said p traces which together make up a τ-p transform;
repeating said steps with respect to differing angles p; and
plotting said p traces to generate a τ-p representation of said data.

4,628,493

SENSOR SYSTEM WITH TIME DIVISION MULTIPLEXING TELEMETRY

David E. Nelson; David M. Berg, and Robert J. Hannon, all of Rochester, N.Y., assignors to Hydroacoustics Inc., Rochester, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,902
Int. Cl.[4] G01V 1/22; H04J 3/00
U.S. Cl. 367—79 56 Claims



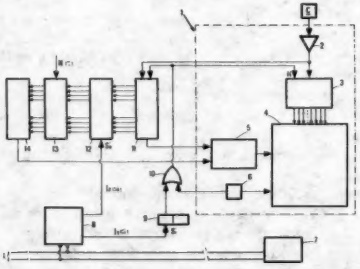
6. The method of telemetering signals from an array of sensors which comprises the steps of time division multiplexing said signals by sampling said signals to provide analog samples such that the samples from the same sensor are repetitive at a first rate higher than the Nyquist rate for the highest frequency component of interest of said signals, transmitting said samples to a receiving station sequentially at a second rate which is approximately proportional to said first rate multiplied by number of sensors in said array, demultiplexing and filtering said samples at said receiving station to provide output signals, time division multiplexing said output signals at a third rate lower than said first rate which is at least as high as said Nyquist rate for the highest frequency component of interest, and processing said multiplexed output signals to provide data from said array.

4,628,494

METHOD FOR THE REMOTE CONTROL OF SIGNAL ACQUISITION DEVICES BY MEANS OF A NARROW PASSBAND TRANSMISSION CHANNEL AND A DEVICE FOR THE IMPLEMENTATION OF THE METHOD

Joseph Rialan, Meudon, and Gérard Thierry, Paris, both of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Dec. 16, 1983, Ser. No. 562,223
Claims priority, application France, Dec. 16, 1982, 82 21284
Int. Cl.[4] G01V 1/22, 1/26
U.S. Cl. 307—79 20 Claims



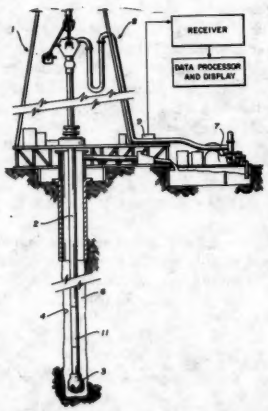
1. Method for the remote control of devices located at a distance from a control station to cause said devices to process and record received data signals in response to commands received from said control station on a narrow passband channel, the transmission time of such commands on said transmission channel being predetermined, and which makes it possible for the devices to acquire and process all signals which are received by said devices subsequent to a selected reference time (t_1), comprising the steps of transmitting on said narrow passband transmission channel a first command signal at an initial time which precedes the reference time by a time interval which is at least equal to said predetermined transmission time, initiating in said devices the processing and recording of the above-mentioned received signals upon receipt of said first command signal therein, transmitting on said narrow passband transmission channel a second command signal at said selected reference time with this second command signal being received by said devices at a later time (t_2) depending on said predetermined transmission time, and identifying from among all of the signals recorded by said devices, those signals recorded at and following a time which is prior to the time (t_2) by the amount of said predetermined transmission time.

4,628,495

MEASURING WHILE DRILLING APPARATUS MUD PRESSURE SIGNAL VALVE

James M. Peppers, and Farhat A. Shaikh, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 9, 1982, Ser. No. 406,741
Int. Cl.[4] G01V 1/40
U.S. Cl. 367—85 8 Claims



1. In a measurement while drilling system for borehole drilling having a downhole instrument connectable in a drill string of a rotary drilling rig including apparatus to sense geological and geophysical parameters and a valve apparatus to pulse modulate drilling fluid flowing in said drill string, and surface apparatus connected to a drilling fluid flow conductor for extracting intelligence carrying information from the modulated drilling fluid, an improved valve apparatus comprising:

(a) a drilling fluid flow pulse modulating pressure pulse valve member longitudinally, movably mounted in a body member and movable from a retracted position substantially removed from the drilling fluid flow and an extended position disposed at least partially within the drilling fluid flow thereby temporarily restricting drilling fluid flow within the drill string;

(b) said pulse valve member is a tubular member having a lower end portion displaceable from said body member into said drilling fluid and an upper end portion with opposed fluid pressure force areas thereon being in fluid communciation with the drilling fluid flow such that forces due to said drilling fluid acting on said pressure

pulse valve member are balanced in a longitudinal direction;

(c) said pulse valve member has a recess in an upper end portion thereof for receiving therein a plunger portion of said actuator;

(d) a seal assembly operably mounted between said body member and said pulse valve member sealably separating the exterior of said tubular member lower end portion that is immersed in said drilling fluid from upper portions of said pulse valve member;

(e) an actuator mounted with said pulse valve member and having means to move said pulse valve member longitudinally between said extended and retracted positions independent of pressures of the drilling fluid acting on said pulse valve member to a normally retracted position;

(f) said actuator has a plunger portion mounted in said body member and extending into said pulse valve member upper end portion recess; a seal assembly mounted in said body member contacts a mid portion of the pulse valve member and another seal assembly on said plunger of said actuator contact an interior surface of said pulse valve member separating said mud flow within said pulse valve member from said actuator, said seal assemblies being located on said pulse valve member in positions defining equal pressure force areas that are equal in area and opposite in force producing direction in order to force balance said pulse valve member with respect to the drilling fluid; and

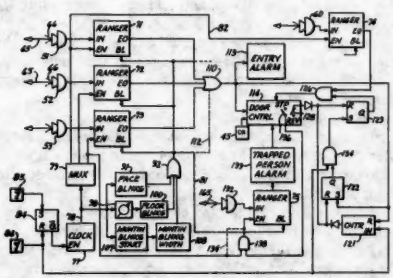
(g) said actuator and said means to move said pulse valve member include a piston and cylinder formed therebetween within said body member and displaceable by fluid pressure on opposite effective sides thereof to displace said pulse valve member.

4,628,496

ULTRASONIC SENSING AND MONITORING SYSTEMS

Charles E. Lee, Miller Place, N.Y., assignor to Von Duprin, Inc., Indianapolis, Ind.

Filed Jul. 27, 1984, Ser. No. 635,300
Int. Cl.[4] G08B 21/00
U.S. Cl. 367—93 **58 Claims**



1. A method of sensing the presence of a person in a space having thereat an object capable of reflecting ultrasonic pulses, comprising in combination the steps of:

sending ultrasonic pulses into said space and toward said object;

suspending transmission of those ultrasonic pulses into said space which would produce echoes at said object;

receiving echoes of ultrasonic pulses from said space; and

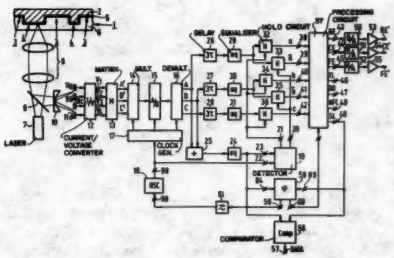
sensing said person with the aid of said received echoes.

4,628,497

APPARATUS FOR REPRODUCING INFORMATION FROM AN OPTICALLY READABLE RECORD CARRIER

Martinus P. M. Bierhoff, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 9, 1984, Ser. No. 578,459
Claims priority, application Netherlands, Oct. 17, 1983, 8303562
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—44 **8 Claims**



1. An apparatus for reproducing information from an optically readable record carrier on which the information is digitally stored in the form of a track of optically detectable pit areas which alternate with intermediate land areas, such apparatus comprising:

an optical system for projecting a light beam which produces a spot of light on the record carrier which is reflected therefrom and modulated thereby;

an optical detector for detecting the light beam reflected from the record carrier and generating a first detection signal corresponding to the modulation produced by pit areas of said track and a second detection signal corresponding to the modulation produced by land areas of said track; and

track-loss detection means coupled to said optical detector for generating a track-loss signal which is an indication of a condition in which the spot of light produced on the record carrier by the light beam is positioned off the track to a specific extent, such track-loss signal being generated when said first detection signal exceeds a predetermined fraction of said second detection signal.

4,628,498

DISC LOADING APPARATUS FOR USE IN A DISC PLAYER

Ryoji Takamatsu; Kouji Umezawa, both of Kanagawa, and Tsutomu Toyoguchi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 30, 1985, Ser. No. 729,122
Int. Cl.[4] G11B 1/00, 17/04
U.S. Cl. 369—77.1 **6 Claims**

1. An optical disc loading apparatus for use in an optical disc player having a disc rotating device, comprising:

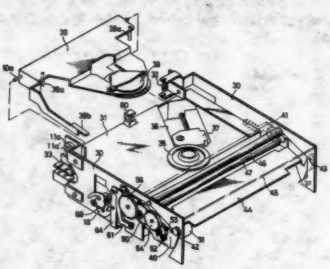
arm means movably supported by a frame between first and second positions,

an upper roller rotatably mounted on said frame,

a lower roller rotatably mounted on said arm means for moving a disc toward a first direction parallel to a plane of said disc in cooperation with said upper roller when said arm means is in said first position, and then moves downwardly beyond a plane of said disc rotating device for putting said disc on said disc rotating device free to be rotated thereby as said arm means moves from said first position to said second position,

a chassis having said disc rotating device and an optical head carried thereon and supported by resilient members relative to said frame, and

locking means including an engaging member provided on said chassis and a locking member provided on said frame for locking said chassis to said frame to engage with said engaging member when said arm means is at an intermediate third position between said first position and second



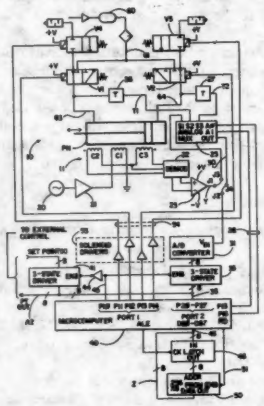
position, and means on said arm means acting when said lower roller is moved downwardly beyond said plane of said disc rotating device, for unlocking said chassis relative to said frame to release the chassis from said engaging member in response to the movement of said arm means to said second position from said intermediate position.

4,628,499

LINEAR SERVOACTUATOR WITH INTEGRATED TRANSFORMER POSITION SENSOR

Geoffrey G. Hammett, Duluth, Ga., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Jun. 1, 1984, Ser. No. 616,292
Int. Cl.[4] G05B *11/28*; F15B *13/16*
U.S. Cl. 364—167 **25 Claims**



1. An integrated servomechanism and position sensor apparatus, comprising:

an actuator including a variably positionable magnetically permeable portion confined to move only within a predetermined space;

a split secondary transformer having a primary coil and a pair of spaced-apart secondary coils;

means for exciting said primary coil to produce a time-varying electromagnetic field within said predetermined space,

movement of said magnetically permeable portion within said predetermined space coupling said electromagnetic field into said secondary coils;

circuit means connected to said secondary coils for providing a coil signal which varies as a function of the position of said magnetically permeable portion of said actuator;

means responsive to said coil signal for transforming said coil signal into an actual position signal which varies as function of the position of said actuator;

command position signal means for providing a desired position signal corresponding to a desired position for said actuator;

means for providing a driving signal as a function of the difference between said desired position signal and said actual position signal; and

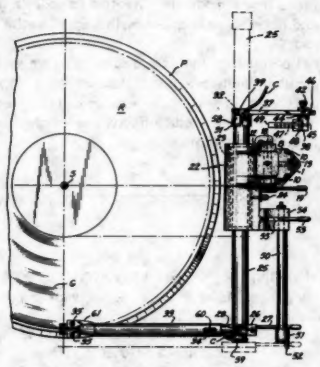
actuator moving means responsive to said driving signal for generating an actuator driving force within said predetermined space for causing said actuator to move toward said desired position.

4,628,500

AIR BEARING STRAIGHT LINE TRACKING PHONOGRAPH TONEARM

F. Bruce Thigpen, Tallahassee, Fla., and Edison A. Price, New York, N.Y., assignors to Eminent Technology, Inc., Tallahassee, Fla. and Edison Price, Inc., New York, N.Y.

Filed May 30, 1985, Ser. No. 739,426
Int. Cl.[4] G11B *3/38, 21/00*
U.S. Cl. 369—249 **6 Claims**



1. An air bearing straight line tracking phonograph tonearm comprising

a mounting base having a vertical extension with a tightening screw and a leveling setscrew and attachable through a sub-base plate to a mounting board for a phonograph record turntable;

a leveling post attached to the vertical extension of the mounting base and having a horizontal leveling slot and leveling setscrews at its lower end in engagement with the mounting base and having a vertical height adjustment slot at its upper end;

a vertical tracking angle arc adjustment block attached to the leveling post by a setscrew in the vertical height adjustment slot therein and having an arcuate rear face and a transverse slot with a corresponding arcuate rear face having a raised knurled rack thereon;

a rotatable knurled shaft passing through the transverse slot in the vertical tracking angle arc adjustment block and engaging the raised knurled rack on the arcuate rear face of the slot, the knurled shaft having a vertical tracking angle adjustment lever operating handle at one end and also passing through holes in bearing blocks attached to an air bearing housing containing an air manifold tube and having an air supply nipple;

a spindle tube passing through and slidable on an air cushion in the air manifold tube and having attached around one

end a coupling joint with a lever arm and an expandable bifurcated collet with a setscrew and having attached around the other end a counterweight cap with a recess having a tightening screw at a slot in the recess end;

a tonearm tube with tapered wall thickness which is readily attachable and detachable at a length adjustment slot in its base end to the collet and which has a damped integral headshell at its outer end attached to a phonograph cartridge having a stylus for engaging and radially tracking a spiral groove in a phonograph record on the turntable;

a decoupled counterweight arm having counterweights thereon and a damped bifurcated leaf spring at one end, said arm being readily attachable and detachable into the recess and slot of the counterweight cap by engagement of the tightening screw with the damped bifurcated leaf spring which allows horizontal motion but prevents vertical motion; and

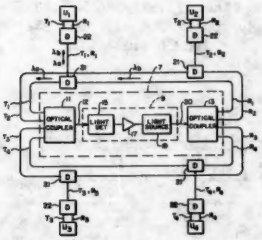
a rotatable eccentric cuing rod parallel to the spindle tube and engageable with the lever arm on the coupling joint, said cuing rod having at one end a cap with an eccentric pin and having at the other end a cuing lever operating handle and mounted in a cuing housing attached to the air bearing housing.

4,628,501

OPTICAL COMMUNICATIONS SYSTEMS

Claire E. Loscoe, Howell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 29, 1983, Ser. No. 566,622
Int. Cl.⁴ H04B *9/00*
U.S. Cl. 370—3 **8 Claims**



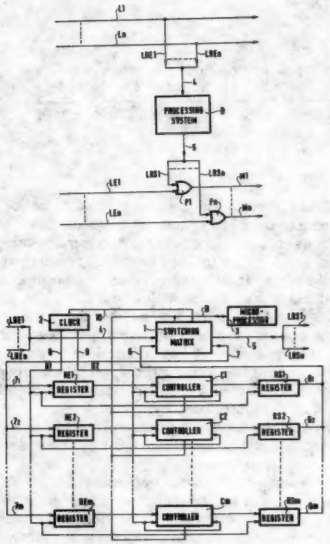
1. A wavelength diversity optical communication system comprising a plurality of user stations each connected to a central active star coupler by means of separate transmit and receive optical fibers and wherein all of said user stations comprise transmitters and tunable receivers, all of which transmitters operate on the same wavelength, λ_1, said star coupler comprising means to detect transmitted signals from all of said user stations on said transmit optical fibers at wavelength λ_1, and produce separate light signals at different wavelengths for each of said user stations, means to apply each of said separate light signals to an optical coupler having an output optical fiber for each of said user stations with the intelligence of all said user stations modulated thereon at a different wavelength, said output optical fibers comprising the receive signal fibers of said user stations, and wherein said tunable receiers can be tuned to any desired one of said different wavelengths.

4,628,502

DATA AND SIGNALING TIME SLOT TRANSFER AND PROCESSING SYSTEM FOR A SET OF MULTIPLEX LINES

Pierre Boulard, Lannion, and Roger Gouriou, Louannec, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Sep. 11, 1984, Ser. No. 649,406
Claims priority, application France, Sep. 14, 1983, 83 14619
Int. Cl.⁴ H04J *3/16, 3/02;* H04Q *11/04*
U.S. Cl. 370—84 **5 Claims**



1. A data and signaling time slot transfer and processing system for a set of n first 2.048 Mbit/s multiplex lines with the information in each data or signaling time slot having a bit rate of 64 kbit/s, comprising m serial communication controllers, a clock, input and output registers associated with said controllers, said input registers being adapted to effect a bit rate change from 2.048 Mbit/s to 64 kbit/s and said output registers being adapted to effect a bit rate change from 64 kbit/s to 2.048 Mbit/s, a switching matrix effecting space-division switching and time-division switching and adapted to be connected on its input side to said m first multiplex lines by switching matrix input lines and to m input lines and on its output side to a set of n second multiplex lines by switching matrix output lines and to m output lines, wherein each controllers is connected to an input register and an output register, each input register has its output connected to said switching matrix by an output line, each output register has its input connected to said switching matrix by an input line, said clock has a first output adapted to supply a composite clock signal to each input and output register and a second output adapted to supply a clock signal to each controllers, said clock is adapted to supply clock signals to said switching matrix, any time slot of said first multiplex lines is connected to a fixed time slot of any output line, said output line fixed time slot is the same for all output lines, the contents of said output registers are transferred into a fixed time slot of said input lines, said input line fixed time slot is the same for all input lines, a fixed time slot of said input line is connected to any time slot of any of said switching matrix output lines, and said input and output line fixed time slots are the same.

4,628,503

METHOD AND DEVICE FOR PERFORMING A BUS REQUEST AND COLLECTIVE ACKNOWLEDGEMENT IN A PROCESS BUS SYSTEM

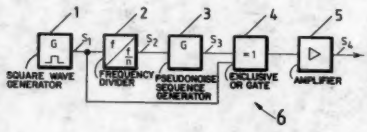
Timm Grams, Viernheim; Werner Deck, Ludwigshafen; Johannes Figge, Lorsch, and Hartmut Siebert, Mannheim, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Feb. 9, 1984, Ser. No. 578,670

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 3304300

Int. Cl.[4] H04J 3/00

U.S. Cl. 370—85 7 Claims



1. Method for performing a bus request or collective acknowledgement on a bus system, in a process bus system for serial data transmission, including subscribers of the process bus system, and a bus control device, which comprises generating a band-limited signal capable of superimposition at all of the subscribers in accordance with a common given principle, transmitting the band limited signal by the subscribers for performing a bus request or collective acknowledgement, and analyzing the signal with the bus control device, the method which further comprises forming the signal which is capable of superimposition in the form of an identical digital pseudo noise signal at all of the subscribers, by:

phase modulating a pulse sequence of square-wave oscillations by means of a digital signal formed of a pseudostochastic binary sequence;

selecting a number of pulses per period of the binary sequence which is substantially twice as high as the maximum number of subscribers connectible to the process bus system; selecting the frequency of the square-wave oscillations in such a manner that the maximum of the power density spectrum of the pulse sequence substantially corresponds to the band center frequency f_M of a predetermined frequency band having a band width B; and selecting a number k of the square-wave oscillations per pulse of the binary sequence in such a manner that 1/k substantially correspond to a relative band width B/f_M.

4,628,504

DISTRIBUTED BUS CONTROL COMMUNICATION PROTOCOL

Jeffrey R. Brown, Chicago, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 31, 1983, Ser. No. 462,263

Int. Cl.[4] H04J 3/02

U.S. Cl. 370—85 24 Claims

1. A variable time division distributed bus control system for determining the order in which a plurality of stations can communicate messages over a common communicatin channel, said messages including at least a global message requiring acknowledgement by a specified station and end-of-transmission messages to inform said stations in the communication system that the transmitting station has ended transmission, said system being arranged to support the immediate acknowledgement of said global messages by said specified stations, said system comprising:

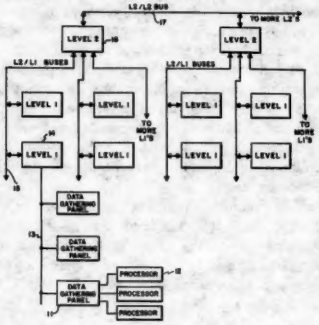
a communication medium for supporting the communication of information between a plurality of stations;

a plurality of stations connected to said communication medium;

each of said stations comprising

time slot means for determining at least one time slot during which an assigned station can transmit information over said comunication medium, each time slot having only one station asigned thereto,

transmission control means responsive to messages being transmitted over the communication medium and responsive to said time slot means for transmitting messages over said communication medium when it is the turn of each station to transmit, and



acknowledgement timer means for delaying the transmission of any further messages for a predetermined period of time after the transmission of a global message requiring acknowledgement unless said selected station has acknowledged said global message.

4,628,505

SIGNALING TERMINAL SYSTEM FOR CCITT NO. 7 COMMON CHANNEL SIGNALING SYSTEM

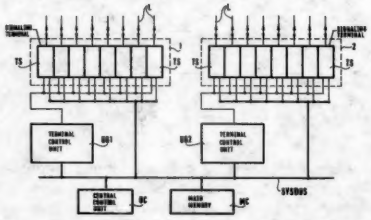
Bernard Paris, Lannion, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Dec. 11, 1984, Ser. No. 680,457

Claims priority, application France, Dec. 15, 1983, 83 20124

Int. Cl.[4] H04J 3/02

U.S. Cl. 370—85 6 Claims

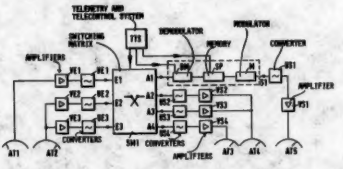


1. A signaling terminal system for the CCITT No. 7 common channel signaling system, comprising a plurality of groups of signaling terminals adapted to be connected to a telecommunication exchange's switching network, a respective terminal control unit for each of said groups of signaling terminals, a central control unit, a main memory, a system bus connecting said signaling terminals and said terminal control units to said central control unit and said main memory, each group of signalling terminals having at least one access circuit connecting said signaling terminals to said system bus, and at least one interchange circuit connecting said signaling terminals to said respective terminal control unit.

4,628,506
METHOD FOR TRANSMITTING COMMUNICATIONS SERVICES VIA SATELLITES

Josef Sperlich, Backnang, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Oct. 16, 1984, Ser. No. 661,337
Claims priority, application European Pat. Off., Oct. 21, 1983, EP83110528.3
Int. Cl.[4] H04J *3/06, 15/00;* **H04B** *7/185, 7/19*
U.S. Cl. 370—104 **7 Claims**

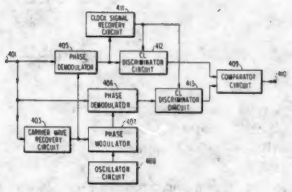


1. Method for transmitting signals associated with a plurality of communications services in time division multiplex operation with multiple access (TDMA) via a satellite equipped with a plurality of receiving units for receiving signals from ground stations, a plurality of transmitting units for transmitting signals to ground stations, and a switching matrix having a plurality of inputs each connected to a respective receiving unit and a plurality of outputs each connected to a respective transmitting unit, the switching matrix being operative for establishing selected connections between its inputs and outputs, said method comprising: switching, by means of the matrix, signals associated with a plurality of services and received at the satellite by at least two of the receiving units to at least one of the transmitting units in the form of signal pulse bursts; demodulating the switched signals in the one transmitting unit; storing the demodulated signals in a memory of the one transmitting unit; then reading the stored signals out of the memory continuously at a pulse rate lower than that of the pulse bursts switched to the one transmitting unit; and broadcasting from the satellite the signals read out of the memory in the form of a continuous stream of signal bits at the lower pulse rate.

4,628,507
BIT ERROR DETECTION CIRCUIT FOR PSK-MODULATED CARRIER WAVE

Susumu Otani, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,362
Claims priority, application Japan, Apr. 18, 1983, 58-67024
Int. Cl.[4] H04B *17/00;* **G06F** *11/00*
U.S. Cl. 371—5 **2 Claims**



1. A bit error detection circuit for a PSK modulated carrier wave, comprising:

carrier wave recovery means (403) for recovering a reference carrier wave of an inputted PSK modulated carrier wave;

first demodulator means (405) responsive to the recovered reference carrier wave for phase-demodulating said input PSK carrier wave into a first demodulated signal;

clock signal recovery means (411) for providing a clock signal in response to the

first demodulated signal;

oscillator means;

modulator means (407) for phase-modulating the reference carrier wave with the output of the oscillator means (408);

second demodulator means (406) responsive to the output of said modulator means for phase-demodulating the input PSK modulated carrier wave into a second demodulated signal;

first discriminator means (412) for discriminating the first demodulated signal into a first digital signal in response to the clock signal;

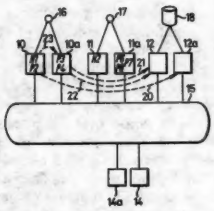
second discriminator means (413) for discriminating the second demodulated signal into a second digital signal in response to the clock signal; and

comparator means (409) for comparing the first digital signal with the second digital signal to provide a pseudo bit error detection signal.

4,628,508
COMPUTER OF PROCESSOR CONTROL SYSTEMS

John C. Sager, Ipswich; Kenneth D. Odam; Robert T. Boyd, both of Woodbridge, and Peter W. Dell, Ipswich, all of England, assignors to British Telecommunications, London, England

Continuation of Ser. No. 363,521, Mar. 30, 1982, abandoned.
This application May 7, 1985, Ser. No. 731,617
Claims priority, application United Kingdom, Mar. 31, 1981, 8110068
Int. Cl.[4] G06F *11/20*
U.S. Cl. 371—9 **12 Claims**



1. A processor control system for simultaneously (a) controlling items of hardware and (b) performing data processing functions not directly associated with control of hardware items, said system comprising:

a plurality of interconnected digital signal processors arranged in pairs so that a pair of said processors is associated with each item of hardware, with each processor of such a pair being capable of independently controlling its associated item of hardware,

at least one additional processor interconnected with said pairs of processors to provide, in conjunction with all other processors in the system, spare processing capacity for said data processing software processes,

one processor of each said pair normally being arranged to operate at least one hardware control process for controlling its associated item of hardware and the other processor of each said pair normally being arranged to operate at least one data processing software process and wherein, in the event of a fault occuring in said hardware control process, then said data processing software process is transferred from said other processor to said provided spare processing capacity and the said at least one hard-

ware control process is transferred to said other processor of that pair.

4,628,509

TESTING APPARATUS FOR REDUNDANT MEMORY

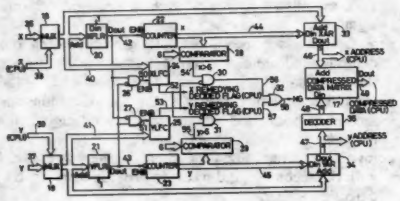
Ikuo Kawaguchi, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,445

Claims priority, application Japan, May 11, 1983, 58-80898; May 11, 1983, 58-80897; May 11, 1983, 58-80899

Int. Cl.[4] G06F *11/20*

U.S. Cl. 371—21 **12 Claims**



1. In an apparatus for testing a redundant memory including means for applying a test pattern to a memory under test which has a matrix of storage cells having X and Y addresses, means for determining failures in the data stored in the storage cells of said memory on the basis of test results obtained by comparing outputs from said memory under test with expected values, and means for remedying said failures along selected redundant lines in the X and/or Y directions of said matrix of storage cells, the improvement comprising:

(a) a compressed data matrix storage device for storing as compressed data only the data relating to failures determined from the test results of said failure determining means;

(b) an address conversion unit which converts the X and Y addresses of said failures detected by said failure determining means into addresses of said compressed data matrix storage device and controls the storing of failure data in said compressed data matrix storage device;

(c) an auxiliary processing unit which judges whether remedy of the failures is possible on the basis of the data of the test results stored in said compressed data matrix storage device and for controlling said remedying means when remedy of the failures is not possible;

(d) means for selecting said redundant lines by analyzing the data in said compressed data matrix storage device and for supplying the identify of said redundant lines to said remedying means; and

(e) means for supplying the data in said compressed data matrix storage device to said remedying means.

4,628,510

MEMORY DEVICE

Shuichi Endo, Takasaki, and Kenichi Tonomura, Gunma, both of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,720

Claims priority, application Japan, Apr. 22, 1983, 58-69967

Int. Cl.[4] G01R *31/28*

U.S. Cl. 371—21 **5 Claims**

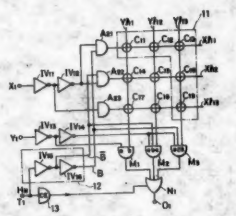
1. A memory device comprising:

(a) an array of memory cells including a plurality of main memory cells which are adapted to be utilized by a user for storing information and a plurality of checking memory cells which store data placed therein at the time of manufacturing of the array which is read out to check a performance characteristic of the array of memory cells prior to the storing of data in the main memory cells;

(b) an addressing means associated with the array of memory cells for permitting selective addressing of either the main memory cells or checking memory cells within the array by the application of selected first or second signal levels to addressing lines coupled to the array;

(c) an output means coupled to the array of memory cells for outputting data from within selected cells within the array in cooperation with the addressing means; and

(d) an inhibiting means for inhibiting the outputting of data



from said output means in response to the application of a control signal of a first predetermined magnitude, wherein the addressing means includes a checking memory addressing means coupled to the inhibiting means which inhibits the reading out of data from the checking memory cells upon application of a control signal of a second predetermined magnitude and enables the reading out of data from the checking memory cells upon the application of a control signal of a third predetermined magnitude.

4,628,511

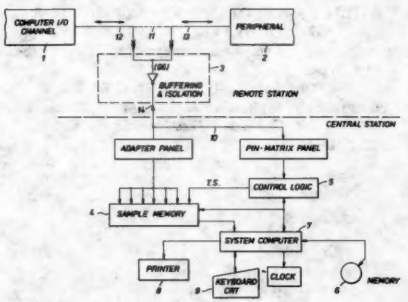
APPARATUS FOR ANALYSIS OF COMPUTER CHANNEL FAILURES

Teddy K. Stitzlein, and William P. Simonds, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 648,338, Sep. 6, 1984, abandoned, which is a continuation of Ser. No. 352,274, Feb. 25, 1982, abandoned. This application Aug. 8, 1985, Ser. No. 764,502

Int. Cl.[4] G06F *11/22*

U.S. Cl. 371—22 **6 Claims**



1. Apparatus for monitoring signals on an input/output channel of a computer to passively detect communications failures between said computer and peripherals of said computer, comprising:

means for accessing and detecting signals on said input/output channel of said computer, without interfering with said signals;

first means interconnected with said means for accessing and detecting for preselecting at least one of said signals;

control means interconnected with said first means for (i) detecting the signal level of said at least one preselected

signal, (ii) generating time information about a particular point in relative time at which said at least one preselected signal is detected, and (iii) generating a predetermined command based upon said detection of said at least one preselected signal and predetermined internal logic;

second means interconnected with said means for accessing and detecting and with said control means for storing signal, count, or time information, or combinations thereof, concerning said detection of said at least one preselected signal based upon said predetermined command; and

analysis means interconnected with said second means for analysis of said stored information to determine from said stored information the cause of said communications failures on said channel and interconnected with said control means for predetermining said internal logic of said control means.

4,628,512

ADDRESS DISTRIBUTION IN DATA STORAGE APPARATUS

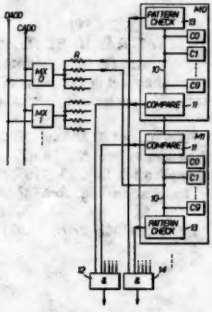
Johnson Loo, Newcastle-under-Lyme, England, assignor to International Computers Limited, London, England

Filed Jan. 11, 1985, Ser. No. 690,726

Claims priority, application United Kingdom, Jan. 24, 1984, 8401806

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—68 **3 Claims**



1. Data storage apparatus comprising:

(a) a plurality of groups of memory chips, each chip having an address input,

(b) a plurality of address busses, one for each of said groups of memory chips, each address bus having a first end and a second end, and each address bus being connected in parallel to the address inputs of all the memory chips in the group in question,

(c) means for applying an address signal in parallel to all the address busses,

(d) first comparator means connected to the first end of each address bus, for comparing the address signal on that bus with the address signal on another one of the address busses, and

(e) second comparator means connected to the second end of each address bus, for comparing the address signal on that bus with a predetermined value.

4,628,513

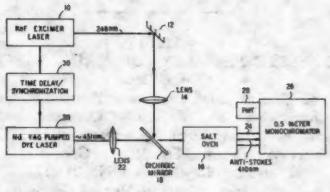
TUNABLE INDIUM UV ANTI-STOKES RAMAN LASER

Jonathan C. White, Stanford, Calif., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 535,808, Sep. 26, 1983, abandoned. This application Aug. 22, 1985, Ser. No. 768,414

Int. Cl.[4] H01S *3/30*

U.S. Cl. 372—3 **6 Claims**



1. A tunable anti-Stokes Raman laser comprising

an indium compound lasing medium including at least one ground state, an intermediate state, and at least one metastable state;

photodissociating means for creating a population inversion between said at least one ground state and a metastable state of said indium compound lasing medium; and

anti-Stokes tunable pump means for creating a transition between said metastable state and a predetermined region near said intermediate state of said indium compound lasing medium, thereby creating a Raman lasing output from said predetermined region to said ground state, where said predetermined region is varied to form said tunable anti-Stokes Raman laser.

4,628,514

MULTIMODE LASER

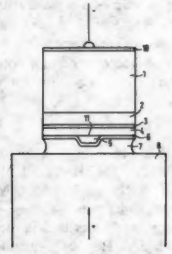
Reimund Dorn, Schwieberdingen, and Martin Schneider, Stuttgart, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 24, 1984, Ser. No. 644,173

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1983, 3332398

Int. Cl.[4] H01S *3/045, 3/19*

U.S. Cl. 372—36 **3 Claims**



1. Multimode laser comprising;

a substrate;

an epitaxial intermediate layer; an epitaxial active layer; an epitaxial capping layer, the conductivity type of the intermediate layer being the same as that of the substrate and opposite to that of the capping layer;

a narrow epitaxial contact stripe of the same conductivity type as the capping layer, the contact stripe being doped to a higher level than the capping layer, the band gap in the contact stripe being smaller than that in the capping

layer, and the doping level at the surface of the contact stripe being higher than that of the remainder of the contact stripe;

a Schottky contact layer in direct contact with the contact stripe and those portions of the capping layer not covered by the contact stripe;

a heat sink; and

a solder body joining said Schottky contact layer to the heat sink.

4,628,515

RING LASER, ESPECIALLY FOR A RING LASER TYPE OF GYRO

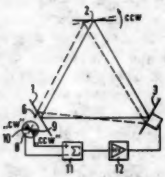
Rüdiger K. Rodloff, Meinersen, and Werner W. Jungbluth, Königslutter, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,322

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412017

Int. Cl.[4] H01S *3/08*

U.S. Cl. 372—107 **10 Claims**



1. A ring laser, especially for a ring laser type gyro, comprising a block made of a thermally and mechanically highly-stable ceramic glass; three corner mirrors, one of which is mounted for tilting about an axis and one of which comprises a semi-transparent separating mirror; a servo-drive for tilting said tiltable mirror about said axis; a differential photo detector positioned behind said tiltable mirror in the beam path of the separated beam portion of one of the rotating wave trains of said ring laser, said differential photo detector comprising at least one differential photo diode, said differential photo diode producing an output signal and being constructed and oriented so that said output signal is a function of the relative position of said separated beam portion of said one of said rotating wave trains thereon; and a control responsive to said output signal for tilting said tiltable mirror with said servo-drive to position said separated beam portion of said one of said rotating wave trains in a predetermined stabilized position on said photo detector.

4,628,516

ELECTRODE ARRANGEMENT IN HEAT RUN VESSELS

Peter Voss-Spilker, Kempen; Wolfgang Reichelt, Moers-Kap.; Achim Kubon, Neuk.-Vluyn, and Franz Keutgen, Lissendorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,660

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339514

Int. Cl.[4] H05B *7/02*

U.S. Cl. 373—72 **5 Claims**

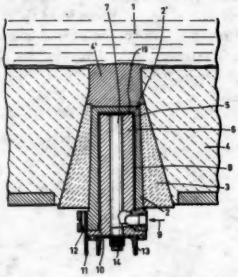
1. An electrode assembly for a melting furnace having a refractory lining defining an inner surface comprising:

an electrode having a head and a rear end including a casing and a replacement body disposed inside the casing, said body and said casing defining an annular slit between annular facing sides and defining a chamber at the head between the casing and the body, said chamber being in fluid communication with said annular slit;

said body having a central bore which is in fluid communication with a cooling medium inlet at the rear end and the chamber, said central bore extending from the rear end to the chamber;

an outlet disposed in the rear end and in fluid communication with the slit;

a terminal means formed on the rear end for connecting the electrode to an electrical circuit; and



a conical refractory component sheathing the exterior of the casing and being embedded in the refractory lining of the furnace, said conical refractory component being frusto-conical in shape with its broad end being disposed at the exterior of the furnace and its narrow end being adjacent the head, said head and said narrow end defining a base of a cavity formed in the refractory lining in which electrically conductive wear-resistant material of solidified melt collects to form a protective cap over the head of the electrode.

4,628,517

DIGITAL RADIO SYSTEM

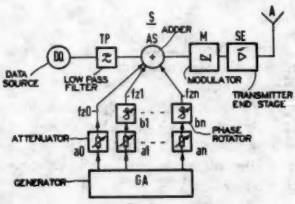
Wolfram Schwarz, Inning; Theodor Schwierz, Aichach, and Bernd Sommer, Lochham, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 644,652, Aug. 27, 1984, abandoned, which is a continuation of Ser. No. 363,770, Mar. 31, 1982, abandoned. This application Sep. 23, 1985, Ser. No. 778,180

Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121146

Int. Cl.[4] H04B *7/02, 15/00*

U.S. Cl. 375—40 **13 Claims**



1. A digital radio system comprising:

a transmitting station operable to provide multi-path propagation including

input means for providing a digital information signal to be transmitted,

transmitter means including a frequency modulator having its own carrier oscillator for producing its own

inherent carrier frequency which is frequency modulated by the digital information signal, and

frequency diversity means connecting said input means to said frequency modulator and operable to produce an additional modulation frequency and a plurality of harmonic modulation frequencies of said additional modulation frequency and feed the digital information signal and the additional modulation frequency to said frequency modulator for generating a plurality of carrier frequencies which are frequency modulated by said digital information signal said plurality of carrier frequencies including the frequency modulated inherent carrier frequency and at least two further frequency modulated carrier frequencies having frequency spacings from said inherent carrier frequency which are equal to said additional modulation frequency; and

a receiving station operable to receive multi-path propagation of the modulated carrier frequencies, including

conversion means, including oscillators which are coherent with respect to one another, for converting the modulated carrier frequencies into an equal frequency position, and

a combiner connected to said conversion means and operable to provide a sum signal having an optimum signal-to-noise ratio and counter transmission disturbances which are caused, in particular, by selected fading as a result of multi-path propagation.

4,628,518

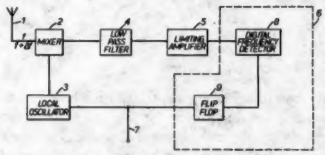
RADIO RECEIVER

Peter E. Chadwick; Philip A. K. Moon, both of Swindon, England, and Norman C. Thompson, Irvine, Calif., assignors to Plessey Overseas Limited, Ilford, England

Continuation-in-part of Ser. No. 294,794, Aug. 20, 1981, abandoned. This application Sep. 15, 1983, Ser. No. 532,653

Int. Cl.⁴ H04L *27/14*

U.S. Cl. 375—88 **9 Claims**



1. A radio receiver for receiving frequency shift keyed (FSK) radio signals in which differing binary bits are transmitted as a different one of two transmission frequencies, the receiver comprising:

a mixer means having a first input for receiving the FSK signal, a second input for receiving a first mixing signal and a second mixing signal having a different frequency from said first mixing signal, said mixer means having an output for providing a mixed signal at said output in dependence upon the received FSK signal and the received first or second mixing signal, said mixed signal having a frequency lying in a first band of frequencies or a second band of frequencies;

a local oscillator means for generating said first and second mixing signal, neither of which is midway between said two transmission frequencies, and having a mixing signal output coupled to said second input of the mixer means supplying said first and second mixing signals to said second input of said mixer means, and said local oscillator means having an input receiving a switching signal which is operative to switch the generation by said local oscillator means of said first and second mixing signals; and

a detector means having an input, coupled to said output of said mixer means which receives said mixed signal, and having a switching output for providing said switching signal, said detector means detecting whether said mixed signal lies in said first or said second band of frequencies and generating said switching signal in dependence upon a transition between the two bands of frequencies such that if said mixed signal lies in a predetermined one of said first or said second band of frequencies, said switching signal switches said local oscillator means thereby causing said mixed signal to shift to the other one of said first or second band of frequencies.

4,628,519

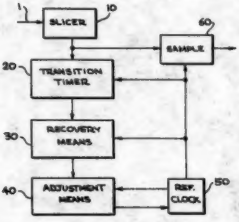
DIGITAL PHASE-LOCKED LOOP CIRCUIT

Hamid Najafi, Palo Alto, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 6, 1984, Ser. No. 597,767

Int. Cl.⁴ H04L *7/02*; H03D *3/24*

U.S. Cl. 375—110 **12 Claims**



1. An apparatus for maintaining one signal in phase with another signal having a transition between a first level and a second level, comprising:

(a) transition timer means for generating a first signal indicating a duration of the transition of the other signal;

(b) recovery means, responsive to said first signal, for generating a recovery signal indicating the timing of the one signal relative to the other signal said recovery means including means for disregarding said first signal if said transition duration is longer than a preselected time; and

(c) adjustment means for adjusting the one signal in response to said recovery signal.

4,628,520

COUNTING APPARATUS FOR COUNTING OBJECTS BY MEANS OF A SHADOW MEASUREMENT

Jan W. Menger, Amerongen, Netherlands, assignor to Staalkat B.V., Aalten, Netherlands

Filed Jun. 22, 1984, Ser. No. 623,328

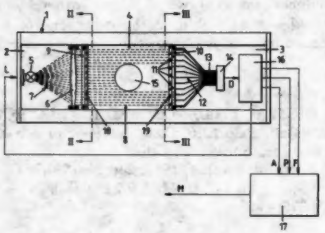
Claims priority, application Netherlands, Jun. 22, 1983, 8302230

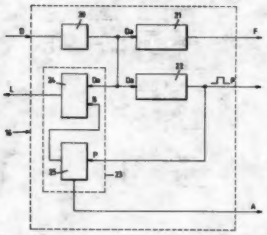
Int. Cl.⁴ G06M *7/00*

U.S. Cl. 377—6 **13 Claims**

1. A counting apparatus for counting objects passed in succession through a light beam present between a light source and a photodetector, in which the photodetector produces a detection signal upon each passage of an object through the light beam, the magnitude of which detection signal depends on the amount of light received by the photodetector and which detection signals are applied to an object counter for counting the number of objects so passed, characterized in that said counting apparatus includes a plurality of light receptors (12) for receiving the light beam (7,8), which receptors (12) are mounted, in-line vertically, the changes in the intensity of the collected light being detected by said photodetector (14); a voltage-to-frequency converter (21) joined to said photodetector for converting the detection signals (D, Da) into a frequency (F) varying in accordance with the magnitudes of the detection signals; a pulse former (22) also joined to said photodetector for converting the detection signals (D, Da) into

count pulses (P) whose width is indicative of the period of time required for an object (15) to pass by; and a data counter (27) operatively connected to said converter (21) and the pulse former (22) of cycles (Fs) of said frequency (F) during the





period of time that a count pulse (P) is present, an object pulse (Y) being applied from the data counter (27) to said object counter (38) in response to the data counter having counted a given number of said cycles (Fs).

4,628,521

INDICATING DEVICE IN MEASURING MACHINE

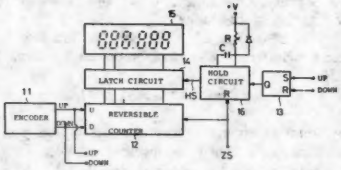
Takeji Nishimura, and Mamoru Yasuda, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1984, Ser. No. 625,880

Claims priority, application Japan, Jul. 14, 1983, 58-128530

Int. Cl.[4] G01D *7/00;* **G06M** *3/12*

U.S. Cl. 377—24 **1 Claim**



1. An indicating device in a measuring machine having a counter capable of conducting adding and subtracting calculations in accordance with up signals and down signals from an encoder operationally associated with relatively movable members relating to the measurement of length, a relative movement value between said relatively movable members being digitally indicated in an indicator on the basis of a counted value of said counter, said indicator being defined by an indicating unit having several digit displays comprised of seven segments, the improvement comprising wherein said indicating device includes:

a flipflop circuit means for receiving up signals and down signals from said encoder as input signals and sensing the change of said input signals from up signals to down signals and vice versa to produce an output signal;

a hold circuit means responsive to said output circuit for outputting a hold signal of a predetermined period of time when said change in said input signals is sensed by said flipflop circuit means, said period of time being variably determined by a time constant circuit means which includes a capacitor and a variable resistance; and

a latch circuit means for successively, renewingly storing the counted value from said counter and causing said indicator to indicate same, and for interrupting said renewingly storing of said counted values in response to a receiving of said hold signal from said hold circuit and latching said indicator to the last counted value, said last counted value being indicated for the duration of said period of time unless shortened by a disappearance of said hold signal.

4,628,522

X-RAY TUBE WITH A MAGNETICALLY SEATED ROTARY ANODE

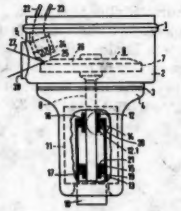
Hans Ebersberger, Kotzenaurach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 693,039

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407269

Int. Cl.[4] H01J *35/04, 35/10*

U.S. Cl. 378—132 **17 Claims**



1. In an x-ray tube having a rotary anode having a drive shaft and a magnetic bearing means for normally magnetically seating said anode within said x-ray tube, and having a mechanical bearing means positioned for supporting said anode in the event of failure of said magnetic bearing means, the improvement in said mechanical bearing means comprising:

said mechanical bearing means having an annular conical surface disposed symmetrically with respect to the axis of rotation of said anode and a complementary mating surface received within said conical surface and normally spaced therefrom when said magnetic bearing means is operational, said complementary mating surface being further positioned for coming into contact with said conical surface and for supporting said anode in the event of failure of said magnetic bearing means.

4,628,523

DIRECTION CONTROL FOR RADIOGRAPHIC THERAPY APPARATUS

Chester L. Heflin, San Jose, Calif., assignor to B.V. Optische Industrie de Oude Delft, Netherlands

Filed May 13, 1985, Ser. No. 733,196

Int. Cl.[4] H05G *1/02;* **A61B** *6/08;* **H01J** *29/02*

U.S. Cl. 378—193 **13 Claims**

1. Radiant energy apparatus comprising:

a patient supporting table,

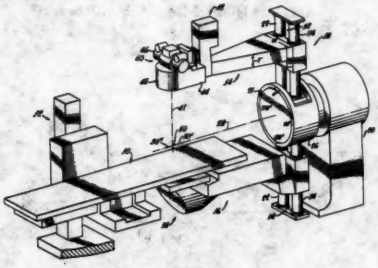
a machine support,

an energy beam source,

a support arm carried by said machine support,

said arm extending along and spaced from a portion of said table, and

means for mounting said energy beam source to said support arm to enable said energy beam source to project a target point along an energy beam axis toward an isocenter point having a predetermined position with respect to said machine support, said means for mounting comprising adjustable means for automatically adjusting the direction



of said energy beam axis relative to said support arm to decrease displacement between said projected target point and said isocenter point, said support arm being mounted to said machine support for rotation about a rotation axis extending through said isocenter point, and said adjustable means comprising means for adjusting the direction of said energy beam axis by an amount related to rotation of said support arm.

4,628,524

X-RAY TOMOGRAPH

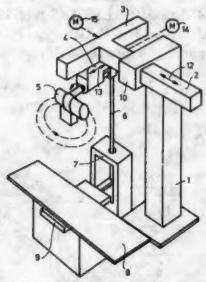
Jürgen Hepke, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 21, 1985, Ser. No. 703,636

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406717

Int. Cl.[4] H05G *1/02*

U.S. Cl. 378—197 **3 Claims**



1. An X-ray tomograph comprising:

X-ray table means for horizontally supporting a patient undergoing examination above a floor;

X-ray picture recording means disposed beneath the table means;

a vertical support column having a first end which is rigidly attached to the floor near the table means and a second end which extends from the floor above the height of the table means;

angular guide means attached to the second end of the column;

first horizontal support means journalled in said guide means for horizontal motion parallel to a longitudinal direction of the table means;

second horizontal support means affixed to one end of the first horizontal support means;

carriage means journalled in the second support means for horizontal motion perpendicular to the longitudinal direction of the table means;

an X-ray tube connected to the carriage means for projecting X-rays through the table means to the recording means;

a coupling rod connecting the carriage means to the recording means to produce coordinated motion of the carriage means and the recording means; and

motor means for horizontally displacing the first support parallel to the longitudinal direction with respect to the guide means and for horizontally displacing the carriage, perpendicular to the longitudinal direction, with respect to the second support means.

4,628,525

M-S TYPE STEREOPHONIC MICROPHONE

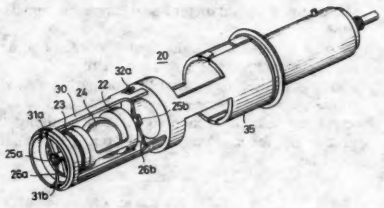
Makoto Iwahara, Sagamihara, and Hiroshi Ogawa, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Mar. 7, 1985, Ser. No. 709,209

Claims priority, application Japan, Mar. 9, 1984, 59-33653[U]

Int. Cl.[4] H04R *5/00*

U.S. Cl. 381—26 **7 Claims**



1. An M-S type stereophonic microphone comprising:

a mid microphone unit having a main axis thereof directed to the front of said M-S type stereophonic microphone;

a side microphone unit having a main axis thereof directed to the side of said M-S type stereophonic microphone and perpendicular to the direction of the main axis of said mid microphone unit;

a unit support body for unitarily supporting said mid and side microphone units;

a main microphone body frame; and

resilient support means comprising resilient support members for resiliently supporting said unit support body on said frame,

said resilient support means resiliently supporting said unit support body so that said unit support body is movable in the main axis direction of said mid microphone unit and in the main axis direction of said side microphone unit.

4,628,526

METHOD AND SYSTEM FOR MATCHING THE SOUND OUTPUT OF A LOUDSPEAKER TO THE AMBIENT NOISE LEVEL

Horst Germer, Schortens, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Sep. 12, 1984, Ser. No. 649,824

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 3334262; Jul. 14, 1984, 3426068

Int. Cl.[4] H04R *27/00*

U.S. Cl. 381—57 **20 Claims**

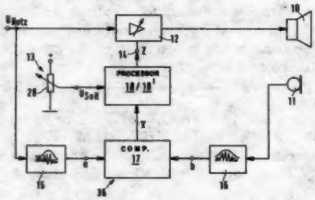
1. Method of automatically adjusting the acoustic output volume of a loudspeaker to accord with changes in ambient

noise level at the loudspeaker location, said loudspeaker having a controllable amplifier equipped with a manual volume control interposed between it and the output of a source of useful signals to be acoustically radiated and equipped with an amplification control terminal, comprising steps of:

producing a composite signal at the output of a microphone exposed to both the acoustic output of said loudspeaker and ambient noise;

producing a first envelope signal by envelope-detecting said useful signal provided at said output of said useful signal source;

producing a second envelope signal by envelope-detecting said composite signal;



continually comparing said first and second envelope signals with each other with respect to at least one parameter thereof and thereby generating a signal representative of the degree of similarity of said envelope signals to each other;

providing a reference signal value corresponding to the setting of said manual volume control;

producing a difference signal by comparing said similarity signal with said reference signal value, and

intergrating said difference signal and applying the integrated difference signal to said control terminal of said amplifier.

4,628,527

MINI HEARING AID

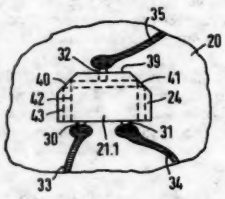
Hans Henneberger, Effeltrich, and Walter Puchta, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 548,798

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1982, 3245030

Int. Cl.⁴ H04R *25/02;* H05G *1/04*

U.S. Cl. 381—69.2 **7 Claims**



1. A miniature hearing aid including a microphone, an amplifier, a battery and a receiver all contained in a housing, wherein said amplifier comprises a plurality of electrical circuit components and a circuit board having a plurality of openings adapted to receive said components; the improvement comprising at least one opening in said circuit board adapted for receiving a component and is in a generally rectangular shape wherein at least one corner portion of the opening is modified by a diagonal intersecting edge forming a cut-off and the openings adapted to receive a rectangular component inserted in the opening while the diagonal intersecting edge bears against a corner of the rectangular component to secure the rectangular component to the opening.

4,628,528

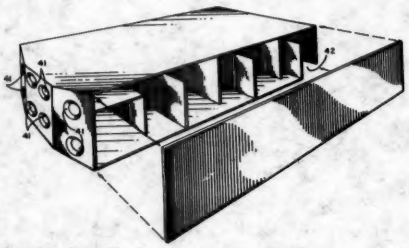
PRESSURE WAVE TRANSDUCING

Amar G. Bose, Wayland, and William R. Short, Wellesley, both of Mass., assignors to Bose Corporation, Framingham, Mass.

Filed Sep. 29, 1982, Ser. No. 427,785

Int. Cl.⁴ H04R *1/28, 1/02;* H03G *3/00*

U.S. Cl. 381—90 **41 Claims**



1. A system for transmitting pressure wave energy with a medium that propagates pressure waves comprising,

transducing means having a vibratile surface for converting energy in one of pressure wave and electrical forms to the other,

at least one low loss pressure wave transmission line means for transmitting energy between said medium and said vibratile surface,

said pressure wave transmission line means having one end adjacent to said vibratile surface and the other end adjacent to said medium and an effective length corresponding substantially to a quarter wavelength at the lowest frequency of pressure wave energy to be transmitted between said medium and said vibratile surface.

4,628,529

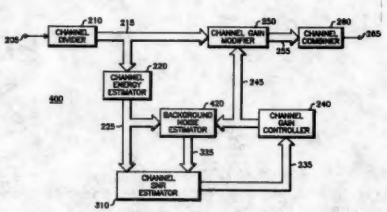
NOISE SUPPRESSION SYSTEM

David E. Borth, Palatine; Ira A. Gerson, Hoffman Estates, and Richard J. Vilmur, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1985, Ser. No. 750,942

Int. Cl.⁴ H04B *15/00*

U.S. Cl. 381—94 **51 Claims**



9. An improved noise suppression system for attenuating the background noise from a noisy input signal to produce a noise-suppressed output signal, said noise suppression system comprising:

means for separating the input signal into a plurality of pre-processed signals representative of selected frequency channels;

means for modifying the gain of each of said plurality of pre-processed signals in response to estimates of the signal-to-noise ratio (SNR) in each individual channel to provide a plurality of post-processed signals; and

means for generating said SNR estimates in each individual channel based upon the current signal energy estimate of the pre-processed signal in each individual channel and the previous noise energy estimate of the pre-processed signal in each individual channel as determined by the detected minima of said plurality of post-processed signals.

4,628,530
AUTOMATIC EQUALIZING SYSTEM WITH DFT AND FFT

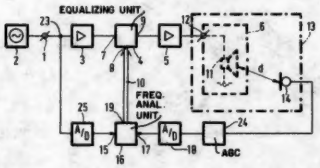
Franciscus J. Op De Beek, and Jacob M. Van Nieuwland, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,737

Claims priority, application Netherlands, Feb. 23, 1983, 8300671; Taiwan, Jul. 5, 1983, 72-12206

Int. Cl.⁴ H03G *5/00*

U.S. Cl. 381—103 **11 Claims**



1. An arrangement for converting an electric signal into an acoustic signal, which arrangement comprises:

an input terminal for receiving an electric input signal,

an electro-acoustic transducer unit for converting an electric signal into an acoustic output signal,

an equalizing unit having a first and a second input and an output, for correcting the frequency characteristic of said electric input signal, which is applied to its first input, under control of a control signal applied to its second input and for supplying the corrected electric signal on its output to said transducer unit,

pick-up means for detecting an acoustic signal and for generating an electric feedback signal which is a measure of the acoustic signal, and

a frequency analyzing unit having a first input coupled to a point in the signal path between the input terminal and the first input of the equalizing unit, having a second input coupled to the pick-up means, and an output for supplying the control signal, which output is coupled to the second input of the equalizing unit, the improvement wherein analog/digital converter means convert said electric input signal and said feedback signal to respective digital signals, the frequency analyzing unit is constructed to subject the previously digitized digital input and feedback signals respectively applied to its first and second input to a Fourier transform, to provide Fourier-transformed versions $F_x(f)$ and $F_y(f)$ respectively of said signals, to calculate a transfer function from the said two versions, and to determine the control signal using the information in this transfer function.

4,628,531
PATTERN CHECKING APPARATUS

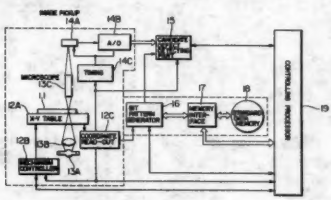
Keiichi Okamoto, Yokohama; Kozo Nakahata, Chigasaki; Yukio Matsuyama; Hideaki Doi, both of Yokohama; Susumu Aiuchi, and Mineo Nomoto, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 27, 1984, Ser. No. 583,867

Claims priority, application Japan, Feb. 28, 1983, 58-30829

Int. Cl.⁴ G06K *9/00*

U.S. Cl. 382—8 **9 Claims**



1. A pattern checking apparatus comprising:

scanning and imaging means for two-dimensionally scanning a pattern to be checked so as to provide sequential image signals;

A/D converter means for converting the image signals sequentially received from said scanning and imaging means into digital image signals;

standard data generating means for sequentially generating standard pattern data corresponding to said pattern to be checked;

first buffer memory means for temporarily storing the digital image signal received from said A/D converter means;

second buffer memory means for temporarily storing the standard pattern data from said standard data generating means;

candidate defect detecting means for comparing the digital image signals and the standard pattern data to detect a candidate defect on the basis of detection of anti-coincidence therebetween;

a first analyzing memory for storing the digital image signal for a portion of said pattern to be checked inclusive of the candidate defect and signals relating to points around the candidate defect, the entry of the digital image signals into said first analyzing memory being stopped when said candidate defect detecting means detects the candidate defect;

a second analyzing memory for storing the standard pattern data for the portion of said pattern to be checked inclusive of the portion corresponding to the candidate defect and signals relating to points therearound; and

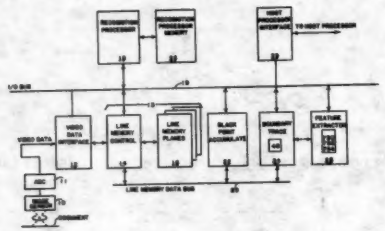
controlling processor means responsive to detection of the candidate defect by said candidate defect detecting means for reading and comparing the digital image signals stored in said first analyzing memory and the standard pattern data stored in said second analyzing memory to determine the amount of positioning error therebetween when a positioning error exists, for reading at least one of the digital image signals from said first buffer memory means and the standard pattern data from said second buffer memory means while relatively correcting said positioning error, and for entering the relatively corrected digital image signal or standard pattern data into said candidate defect detecting means and said first or second analyzing memory, so that in reading and comparing again the digital image signal stored in said first analyzing memory and the standard pattern data stored in said second analyzing memory, the inclusion of positioning errors as candidate defects is minimized and a candidate defect in a practically allowable error range is removed from the remaining candidate defects, thereby to detect a true defect.

4,628,532

ALPHANUMERIC HANDPRINT RECOGNITION

David H. Stone, West Hartford; Leon A. Pintsov, Manchester, and Donald P. D'Amato, Avon, all of Conn., assignors to Scan Optics, Inc., East Hartford, Conn.

Filed Jul. 14, 1983, Ser. No. 513,403
Int. Cl.[4] G06K 9/48
U.S. Cl. 382—21 13 Claims



1. An identification process comprising the steps of:
storing information commensurate with at least a portion of the boundary of an object to be identified;
analyzing the stored information to ascertain the location of points on the object boundary which meet preselected curvature conditions, at least some of said ascertained points being points of peak curvature which lie within regions of preselected length and curvature on the object boundary;
further analyzing the stored information to determine the geometric shape of the object boundary regions adjacent to the ascertained points;
identifying each of the analyzed boundary regions as a feature of a preselected set of features on the basis of geometric shape;
additionally analyzing the stored information to determine the position relative to the object as a whole of each identified feature;
also analyzing the stored information to determine the direction of each feature relative to a predetermined orientation;
preparing a range testable encoded description of the said object boundary portion in the entirety;
preparing a range testable encoded description at the identified features on the said boundary portion and their interrelationship;
generating a series of generalized descriptions which define the geometric shape of all probable permutations of the objects to be recognized, said generalized descriptions including both desired and undesired features and being in the said range testable code;
comparing the encoded descriptions with generalized descriptions of the series of generalized descriptions; and
noting the identify of the object when the encoded descriptions match a generalized description.

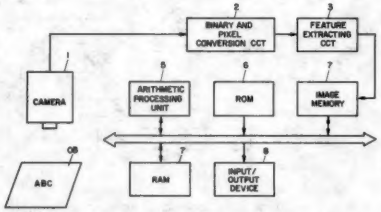
4,628,533

PATTERN RECOGNITION APPARATUS

Yasuo Hongo, and Yoshio Nitta, both of Tokyo, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Jan. 25, 1984, Ser. No. 573,810
Claims priority, application Japan, Jan. 26, 1983, 58-9805
Int. Cl.[4] G06K 9/62
U.S. Cl. 382—27 2 Claims

1. A pattern recognition apparatus comprising:
(a) means for scanning an unknown pattern and providing a video signal corresponding to an image of the unknown pattern;
(b) binary and pixel conversion means for dividing the image into an array of pixel elements and converting the video signals into binary values using a threshold level, each of the binary values corresponding to a respective one of the pixel elements;
(c) feature extracting means for converting the binary values corresponding to the pixel elements into segment data corresponding to the image, the segment data being derived from segments of the image each consisting of a horizontal series of pixel elements having a first binary value;
(d) memory means for storing the segment data corresponding to the image of the unknown pattern and data representing a plurality of standard patterns, the data representing each of the standard patterns comprising:
(i) a standard bit matrix B_S^K derived by dividing a framed image of the standard pattern into a specified array of meshes, each of the meshes corresponding to a resepctive element of the matrix B_S^K, each element of the matrix B_S^K having the first or a second binary value depending respectively upon whether or not the element is preselected as a horizontal or vertical deformation element,
(ii) a mask bit matrix B_M^K having elements corresponding to respective ones of the meshes of the specified array, each element of the matrix B_M^K having the second or the first binary value depending respectively upon whether or not the element is preselected as a mask element,
(iii) a horizontal deformation bit matrix B_H^K having elements corresponding to respctive ones of the meshes of the specified array, each element of the matrix B_H^K having the first or the second binary value depending



respectively upon whether or not the element is preselected as a horizontal deformation element, and
(iv) a vertical deformation bit matrix B_V^K having elements corresponding to the meshes of the specified array, each element of the matrix B_V^K having the first or the second binary value depending respectively upon whether or not the element is preselected as a vertical deformation element;
(e) arithmetic means for performing preprogrammed operations on the data stored in the memory means including:
(i) means for comparing a width and a height of the unknown pattern with the width and height of a search frame,
(ii) means for framing the image of the unknown pattern and dividing the framed image into the specified array of meshes and deriving a bit matrix B of the image having elements corresponding to respective ones of the meshes of the specified array, each element of the matrix B having the first or the second binary value depending respectively upon whether or not a segment of the image of the unknown pattern is present in the corresponding mesh,
(iii) means for matching the unknown pattern to one of the standard patterns by computing the deviation $D^K(B)$ between the unknown pattern and each one of the standard patterns, the deviation $D^K(B)$ being computed by performing a prescribed operation on at least a corresponding block of the matrix B and the matrices B_S^K, B_M^K, B_H^K and B_V^K representing each one of the stan-

dard patterns wherein the prescribed operation is defined as

$$D^K_{ij}(B) = \Sigma\, B^K_S(k,l) \oplus [B^K_M(k,l) \cdot \{D^K_H(B(k,l)) + D^K_V(B(K,l))\}]$$

where

$$D^K_H(B(k,l)) = B(k,l) \text{ if } \Sigma\, B^K_H(k,l)B(k,l) = 0,$$

$$D^K_H(B(k,l)) = B(k,l) + B^K_H(k,l) \text{ if } \Sigma\, B^K_H(k,l)B(k,l) \neq 0,$$

$$D^K_V(B(k,l)) = B(k,l) \text{ if } \Sigma\, B^K_V(k,l)B(k,l) = 0,$$

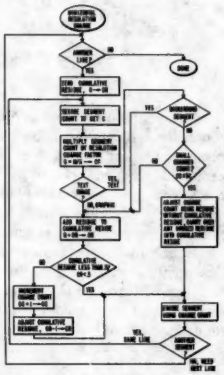
$$D^K_V(B(k,l)) = B(k,l) + B^K_V(k,l) \text{ if } \Sigma\, B^K_V(k,l)B(k,l) \neq 0.$$

4,628,534

METHOD FOR CHANGING THE RESOLUTION OF COMPRESSED IMAGE DATA

J. Nathaniel Marshall, Boston, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jul. 6, 1984, Ser. No. 628,698
Int. Cl.⁴ G06K *9/36*
U.S. Cl. 382—41 **7 Claims**



1. A method for changing the horizontal resolution of a stored image while in compressed image data form, wherein the image data is originally represented as pixels in lines and columns of adjacent pixels, and wherein the image data in binary format is compressed by encoding the image data for each line of pixels such that all adjacent pixels having the same binary value are grouped and each group represented by a binary code indicating the particular binary value and a binary number indicating the number of pixels in each group, and comprising the steps of:

A. setting a cumulative fractional residue to zero in an incrementing and decrementing counter;

B. reading out of storage the compressed image data for one line of the image at a time;

C. multiplying the compressed image data representing each group of adjacent pixels having the same binary value within said one line at a time of the image by a number indicating the degree of horizontal resolution change desired in the image to get a changed pixel count which is the new number of pixels in each group of adjacent pixels having the same binary value;

D. adjusting said cumulative fractional residue such that when each of said changed pixel counts is a number having a whole integer and a fraction less than one-half, to round off the changed pixel count to the whole integer and add the deleted fraction to said cumulative fractional residue in said counter, and such that when each of said changed pixel counts is a number having a whole integer and a fraction greater than one-half to round off the changed pixel count to the next highest whole integer and subtract the deleted fraction from said cumulative fractional residue in said counter; and

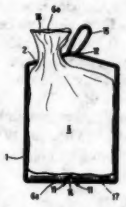
E. repeating steps B through D for each scan line of said compressed image.

4,628,535

LARGE SACK COMPRISING A DOUBLE-WALLED OUTER SACK AND AN INSERTED INNER SACK

Konrad Tetenborg, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,437
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1982, 3207322
Int. Cl.⁴ B65D *33/00, 33/14, 33/16*
U.S. Cl. 383—24 **11 Claims**



1. A large sack construction, comprising an outer sack formed by an essentially tubular member having double-ply walls, the walls having inner and outer wall portions joined by first and second opposite folded edges of the member which extend longitudinally when the outer sack is in a flattened, extended condition, and the walls also having at least one set of superposed severed edge portions extending transversely between respective ends of the opposite folded edges and interconnected by at least one seam, an inner sack inserted within the outer sack, first band means extending through a loop formed by the first folded edge of the essentially tubular member with portions of the first folded edge being ruffled together and held together by the first band means to form a base for the outer sack, second band means extending through loops formed by portions of the second folded edge of the essentially tubular member, the loops of the second folded edge being formed by slots in the essentially tubular member extending inwardly from the second folded edge, and portions of the loops of the second folded edge being separately ruffled and held together by the second band means to form a mouth for the outer sack.

4,628,536

BAG HAVING INTERMITTENT ORIENTATION DRAW TAPE AND METHOD OF MAKING

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 11, 1985, Ser. No. 722,045
Int. Cl.⁴ B65D *33/28*
U.S. Cl. 383—75 **14 Claims**

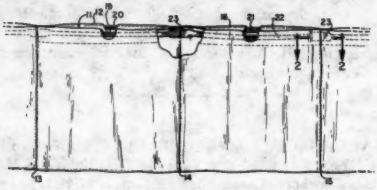
1. A draw tape bag for carrying trash and the like comprising:

two panels forming an open top, closed bottom bag, said panels being joined along the sides of said bag;

a hem of each panel being folded over adjacent said top, the bottom of each hem being secured to the adjacent panel;

draw tapes in each hem secured at said sides to said panels, each of said draw tapes having:

thick and wide end portions at the extremities where each draw tape is secured at said sides of said panels; and



a relatively thin and narrow central portion between said end portions.

4,628,537

SYSTEM FOR IDENTIFYING A RESPONDING STATION FOR A RADIO COMMUNICATIONS SYSTEM

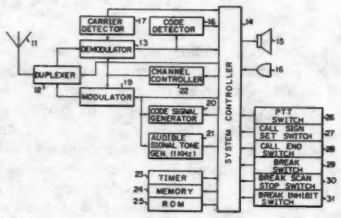
Masashi Shimakata; Katsuaki Kawamura; Toshiaki Tsuchiya; Yuichiro Shioya; Takao Inoue; Mitsuo Syoji, and Keiichi Kuroda, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 18, 1983, Ser. No. 543,056

Claims priority, application Japan, Oct. 19, 1982, 57-183258; Oct. 19, 1982, 57-183260; Oct. 19, 1982, 57-183263

Int. Cl.[4] H04B *7/00*

U.S. Cl. 455—34 **2 Claims**



1. A communications system having a plurality of speech channels one of which is to be selected to convey an information, adapted to perform a simplex communication, comprising:

a searching operation control means for comanding sequential operations of (I) setting the communications system to a receiving state at a speech channel and detecting the presence of a carrier signal and in turn selecting a next speech channel and detecting the presence of a carrier signal if the carrier signal is present at said speech channel, (II) transmitting an audible signal at a selected speech channel at which the carrier signal is not detected, (III) detecting once more the presence of the carrier signal at the selected speech channel, and (IV) memorizing information of the selected speech channel as a non-busy speech channel only if the carrier signal is not present at the selected speech channel.

4,628,538

TELEVISION TRANSMISSION SYSTEM USING OVERMODED WAVEGUIDE

Laddie A. Basa, Claremont, Calif., assignor to Andrew Corporation, Orland Pk., Ill.

Filed May 13, 1985, Ser. No. 733,707

Int. Cl.[4] H04B *1/04*

U.S. Cl. 455—91 **10 Claims**

1. A television transmission system for transmitting UHF signals from a UHF signal generator, said system comprising

an antenna for radiating UHF signals generated by said UHF signal generator,

an overmoded section of waveguide for carrying said signals at least part of the way between said UHF signal generator and said antenna with a low level of power loss, and

a high-power mode filter coupled between the antenna and the overmoded section of waveguide comprising

an overmoded waveguide section for propagating said signals in both a desired mode and undesired higher order modes,

an undermoded waveguide section coupled to said overmoded section for propagating said signals only in said desired mode, the transition between said overmoded and undermoded waveguide sections reflecting said higher-order-mode signals into said overmoded section,

at least one pair of resonant slots formed in opposing walls of said overmoded section for coupling said higher-order-mode signals out of the transmission system,

a pair of side-arm waveguides for receiving said higher-order-mode signals from slots, and

means in said side-arm waveguides for dissipating said higher-order-mode signals.

4,628,539

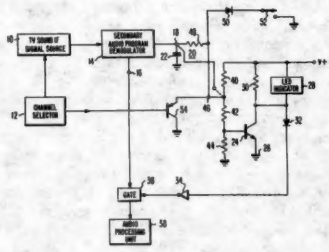
MUTING CIRCUIT

Anthony P. Selwa, Hendricks County, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 25, 1985, Ser. No. 705,372

Int. Cl.[4] H04B *1/10, 1/16*

U.S. Cl. 455—194 **9 Claims**



1. In a receiver including carrier selection means for tuning to a selected signal and further including an information signal demodulator coupled to said carrier selection means, having a baseband output for supplying a demodulated signal to load means and having a logic output for providing a logic output

signal, said logic output signal being of a first type when said information signal is present and being of a second type when said information signal is absent, a signal processing arrangement comprising:

low-pass filter means coupled to said logic output for providing a low-pass filtered logic signal corresponding to said logic output signal, said low-pass filter means including filter capacitance means for storing charge, wherein first and second levels of stored charge correspond to said filtered logic signal being of said first and second types, respectively;

resistance means having a first end coupled to said filter capacitance means and having a second end;

first and second control means respectively coupled to said second end of said resistance means for respectively selectively setting said stored charge to said second level; and

signal gate means having a control input coupled to one of said first and second ends of said resistance means, and being coupled between said baseband output and said load means for coupling said baseband signal to said load means when said filtered logic signal is of said first type and not coupling said baseband signal therebetween when said low-pass filtered logic signal is of said second type.

4,628,540

TUNING ARRANGEMENT HAVING A SUBSTANTIALLY CONSTANT FREQUENCY DIFFERENCE BETWEEN AN RF-CIRCUIT AND AN OSCILLATOR CIRCUIT

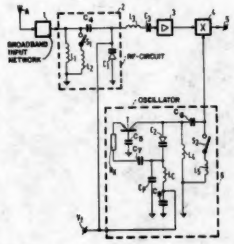
Johannes H. Hendriks, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 25, 1985, Ser. No. 715,570

Claims priority, application Netherlands, Apr. 12, 1984, 8401174

Int. Cl.[4] H04B 1/26

U.S. Cl. 455—197 **3 Claims**



1. A tuning arrangement comprising a mixer stage, a tunable RF-circuit coupled to an input of the mixer stage, an oscillator circuit, coupled to another input of said mixer stage, having a tunable resonant circuit, and means, coupled to said RF- and oscillator circuits, for tuning said circuits to mutually different resonant frequencies, of which at least one of said circuits, having a highest of said resonant frequencies, comprises a parallel arrangement of a circuit inductance and a series arrangement of a tuning capacitor and a padding capacitor, characterized in that in said one circuit, the padding capacitor is shunted by a coil, which reduces the effect of the capacitance of the padding capacitor within the tuning range of said one circuit, and the resonant frequency determined by the coil and the padding capacitor is located below a lowest tuning frequency of said one circuit.

4,628,541

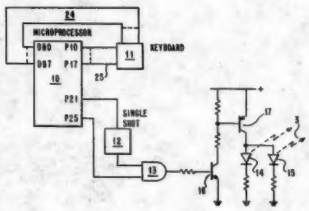
INFRA-RED DATA COMMUNICATIONS SYSTEM FOR COUPLING A BATTERY POWERED DATA ENTRY DEVICE TO A MICROCOMPUTER

John A. Beavers, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 522,063, Aug. 10, 1983, abandoned. This application Feb. 15, 1985, Ser. No. 702,282

Int. Cl.[4] H04B 9/00

U.S. Cl. 455—603 **4 Claims**



1. An infra-red data communications system for coupling a battery powered keyboard data entry device to a microcomputer, in which said keyboard data entry device comprises means, including a microprocessor, for developing, in response to each keystroke, a binary data signal stream representing a start bit followed by a predetermined fixed number of data bits, each binary data signal comprising a predetermined signal level for a fixed period, and for driving an infra-red generator to develop, from each binary data signal, a single burst of infra-red pulses, of which the first pulse corresponds to the leading edge of the binary data signal, said burst extending for a period substantially less than half of the period of the binary data signal, and in which the microcomputer includes means for detecting and amplifying said bursts of infra-red pulses, and signal generating means coupled to the output of the detecting and amplifying means and responsive to detection of an initial pulse in a received burst comprising, when propagation loss is encountered, at least one but less than all of the developed burst of pulses, to generate an output binary code signal comprising a predetermined signal level for said fixed period and having a leading edge corresponding to said initial pulse, said microcomputer further including a microprocessor responsive to the lagging edge of the output signal representing the start bit to generate a series of sampling pulses to sample the output signals representing the data bits.

4,628,542

MODULATED TEA LASER RECEIVER

Neal T. Nomiyama, Sunnydale, Calif.; Robert S. Rohde, Alexandria, and Rudolph G. Buser, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 21, 1985, Ser. No. 714,234

Int. Cl.[4] H04B 9/00

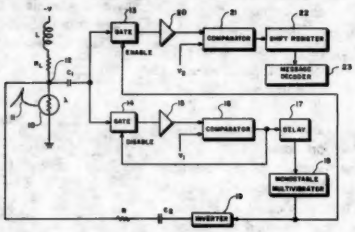
U.S. Cl. 455—619 **2 Claims**

1. A receiver for receiving information modulated onto the output of a pulsed TEA laser, wherein said output has an envelope shape including a relatively short and high-amplitude pulse portion followed by a relatively long and low-amplitude tail portion, whereby said information is amplitude-modulated onto said tail, said receiver including:

a photodetector responsive to the output of said laser, having a high-sensitivity state and a low-sensitivity state, and having an output;

means for switching said photodetector between said states, whereby said photodetector is in said low-sensitivity state in the absence of an output from said laser and during said pulse portion, and in said high-sensitivity state during said tail portion; and

energizable means for demodulating said output of said photodetector, wherein said means for switching includes means for biasing said photodetector to said low-sensitivity state and means responsive to the output of said photodetector during said pulse portion of said laser output for supplying, after a predetermined interval, a first signal for energizing said energizable means for demodulating, and a second signal for biasing said photodetector to said high-sensitivity state.



DESIGN PATENTS

GRANTED DEC. 9, 1986

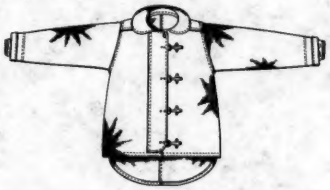
ERRATA

For CLASS	See PATENT NO.
D11-218	287,067
D23-138	287,167

DESIGNS

DECEMBER 9, 1986

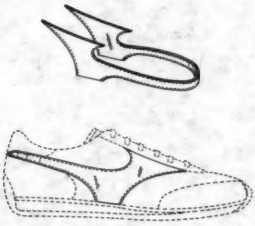
287,060
FIREFIGHTER'S JACKET
William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417
Filed Aug. 23, 1984, Ser. No. 643,493
Term of patent 14 years
U.S. Cl. D2—187



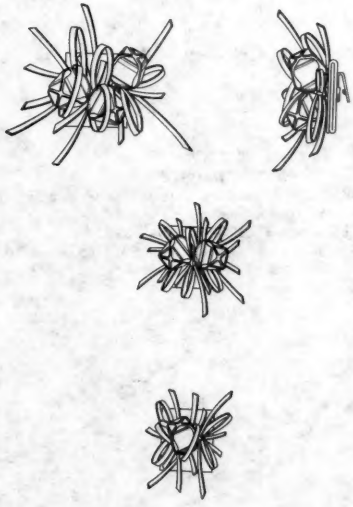
287,061
COMBINED HELMET AND BEVERAGE CONTAINER SUPPORTS
Patrick S. Bound, 658 Longfellow Ct., Warminster, Pa. 18974
Continuation-in-part of Ser. No. 753,921, Jul. 11, 1985, Pat. No. Des. 283,749. This application Feb. 18, 1986, Ser. No. 833,744
Term of patent 14 years
U.S. Cl. D2—246

287,062
CROCHETED WESTERN HAT
Howard N. Hancock, 1375 W. 2950 South, Perry, Utah 84302
Filed Jul. 2, 1984, Ser. No. 627,200
Term of patent 14 years
U.S. Cl. D2—258

287,063
SIDE PANEL FOR A SHOE
Noboru Kohno, Nishinomiya, Japan, assignor to Mizuno Corporation, Osaka, Japan
Division of Ser. No. 212,540, Dec. 3, 1980. This application Oct. 15, 1984, Ser. No. 661,238
Claims priority, application Japan, Jun. 19, 1980, 55-24693; Jul. 3, 1980, 55-26618; Jul. 3, 1980, 55-26619; Jul. 3, 1980, 55-26621
Term of patent 14 years
U.S. Cl. D2—314



287,064
DETACHABLE ORNAMENT FOR FOOTWEAR
Marilyn A. Schnuck, 2701 S. Lindbergh, St. Louis, Mo. 63131
Filed Feb. 21, 1984, Ser. No. 581,546
Term of patent 14 years
U.S. Cl. D2—315

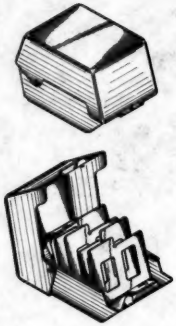


287,065
SHOE SOLE
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Corporation, North Brookfield, Mass.
Filed Jul. 2, 1984, Ser. No. 627,019
Term of patent 14 years
U.S. Cl. D2—320

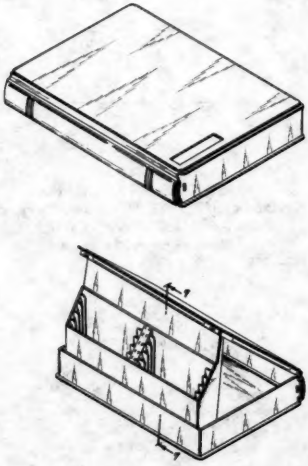
287,066
SHOE HEEL
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Corporation, North Brookfield, Mass.
Filed Jul. 2, 1984, Ser. No. 627,021
Term of patent 14 years
U.S. Cl. D2—323

287,067
BELT ADJUSTER
Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Kogyo Co. Ltd., Tokyo, Japan
Filed Apr. 17, 1984, Ser. No. 601,157
Claims priority, application Japan, Oct. 20, 1983, 58-45470
Term of patent 14 years
U.S. Cl. D11—218

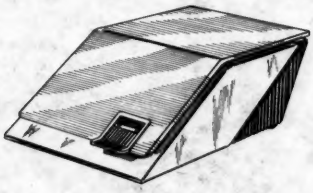
287,068
DISKETTE STORAGE CONTAINER FOR FLOPPY DISKETTES
Jerry M. Long, Pleasanton, and James A. Womack, Los Gatos, both of Calif., assignors to Innovative Concepts, Inc., San Jose, Calif.
Filed Aug. 27, 1984, Ser. No. 644,869
Term of patent 14 years
U.S. Cl. D3—35

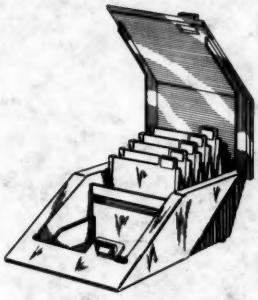


287,069
MAGNETIC DISK STORAGE CASE
Robert A. Egly, 38 Whitewater Dr., Corona del Mar, Calif. 92635, and Patrick Sullivan, 1752 Brookshire Ave., Tustin, Calif. 92680
Filed Apr. 9, 1984, Ser. No. 598,233
Term of patent 14 years
U.S. Cl. D3—35

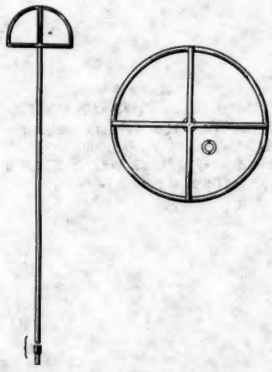


287,070
DISK HOLDER
Robert Staubitz, Avon, Conn., and John Leszczak, Roselle Park, N.J., assignors to The Bates Manufacturing Company, Hackettstown, N.J.
Filed May 18, 1984, Ser. No. 611,586
Term of patent 14 years
U.S. Cl. D3—35





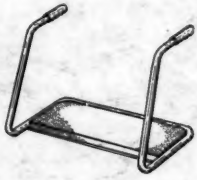
287,071
GOLF BAG ACCESSORY
Howard L. Jobe, 6500 Capitol Dr., Greenbelt, Md. 20770
Filed Nov. 22, 1983, Ser. No. 600,342
Term of patent 14 years
U.S. Cl. D3—37



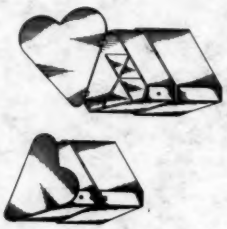
287,072
TOOTHBRUSH
Anthony Pfleger, 2705 Island Ave., Philadelphia, Pa. 19153
Filed Feb. 25, 1985, Ser. No. 705,208
Term of patent 14 years
U.S. Cl. D4—104

287,073
TOOTHBRUSH
Paul H. Thompson, P.O. Box 16, Forest Dale, Vt. 05745
Filed Jan. 3, 1985, Ser. No. 688,598
Term of patent 14 years
U.S. Cl. D4—105

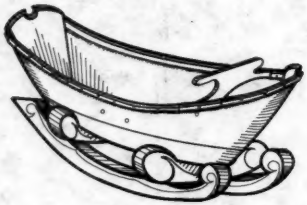
287,074
KNEELING FRAME OR SIMILAR ARTICLE
Daryl G. Ritchie, Melbourne, Australia, assignor to Ritch Engineering Pty. Ltd., Clayton, Australia
Filed Mar. 1, 1984, Ser. No. 585,178
Term of patent 14 years
U.S. Cl. D6—330



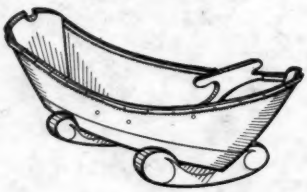
287,075
COMBINED SHOWER STALL FOOT STOOL AND STORAGE COMPARTMENT
George M. Colin, 32072 Sea Island Dr., Laguna Miguel, Calif. 92677, and Bettie L. Patterson, San Juan Capistrano, Calif., assignors to George M. Colin, Laguna Niguel, Calif.
Filed Sep. 11, 1984, Ser. No. 649,538
Term of patent 14 years
U.S. Cl. D6—349



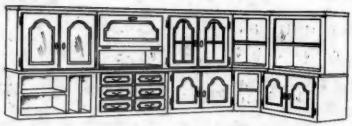
287,076
CHILD'S ROCKER CRADLE OR SIMILAR ARTICLE
Leo Hart, Gloucester, Mass., assignor to Sanbree Corporation, Carlisle, Mass.
Filed Jun. 1, 1984, Ser. No. 616,408
Term of patent 14 years
U.S. Cl. D6—386



287,077
BABY ROCKING CRADLE
Leo Hart, Gloucester, Mass., assignor to Sanbree Corporation, Carlisle, Mass.
Filed Jun. 1, 1984, Ser. No. 616,407
Term of patent 14 years
U.S. Cl. D6—390

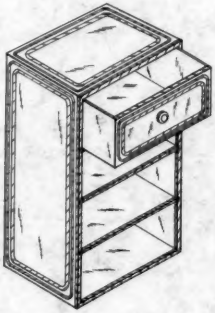


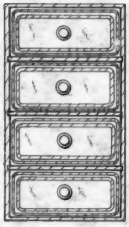
287,078
SHOE RACK
Robert L. Bowsher, 212 - 19th Ave., Moline, Ill. 61265
Filed Feb. 21, 1984, Ser. No. 582,002
The portion of the term of this patent subsequent to Nov. 29, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—450



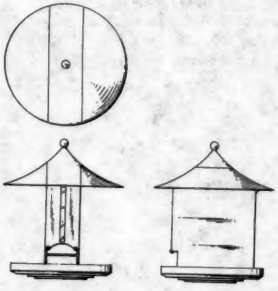
287,079
MODULAR STORAGE UNIT
Jules E. Mintjens, Westmalle, Belgium, assignor to Meubelfabrieken Karel Mintjens N. V., Belgium
Filed Nov. 21, 1983, Ser. No. 553,570
Term of patent 14 years
U.S. Cl. D6—436

287,080
STORAGE CABINET
Mark Densen, 18 Blackburn Pl., Summit, N.J. 07901
Division of Ser. No. 535,246, Sep. 23, 1983, Pat. No. Des. 282,795. This application Sep. 18, 1985, Ser. No. 777,405
Term of patent 14 years
U.S. Cl. D6—446

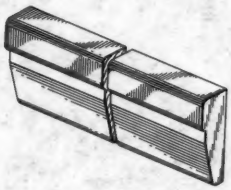




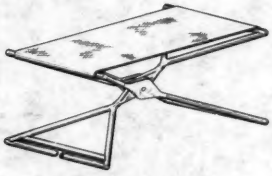
287,081
ROTATABLE DISPENSER FOR BABIES' DIAPERS AND TOILETRY
Jonathan Helinsky, 198 Woodward Ave., Staten Island, N.Y. 10314
Filed Jul. 9, 1984, Ser. No. 629,271
Term of patent 14 years
U.S. Cl. D6—457



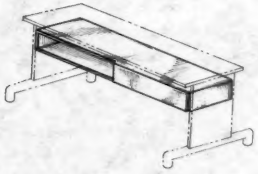
287,082
MOLDING FOR FURNITURE
Thomas F. Gambon, St. Louis, Mo., assignor to Charleswood Furniture Corp., Wright City, Mo.
Filed May 23, 1984, Ser. No. 613,311
Term of patent 14 years
U.S. Cl. D6—491



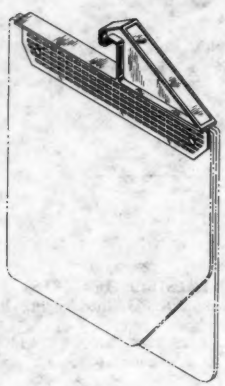
287,083
COLLAPSIBLE HEAD REST
Daniel F. Macedonio, 19020-3 Kittridge St., Reseda, Calif. 91335
Filed Jul. 25, 1984, Ser. No. 634,134
Term of patent 14 years
U.S. Cl. D6—502



287,084
COMPUTER TABLE STORAGE COMPARTMENT
Mark C. Jacobs, 4807 Marlborough Way, Carmichael, Calif. 95608
Filed Jul. 29, 1983, Ser. No. 518,539
Term of patent 14 years
U.S. Cl. D6—510

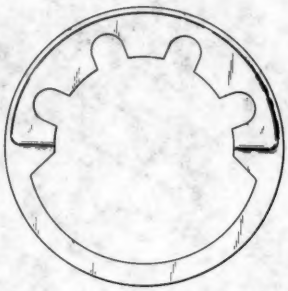


287,085
FLOOR MAT HANGER
Douglas B. Leeds, New York, N.Y., assignor to Thomson-Leeds Company, Inc., New York, N.Y.
Filed Nov. 26, 1984, Ser. No. 674,679
Term of patent 14 years
U.S. Cl. D6—513

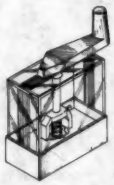


287,086
DRINKING MUG
James L. Meier, Des Plaines, and Scott F. Galloway, Evanston, both of Ill., assignors to Galloway Plastics Incorporated, Northfield, Ill.
Filed May 3, 1984, Ser. No. 606,752
Term of patent 14 years
U.S. Cl. D7—9

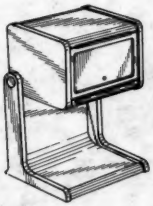
287,087
GOBLET RETAINER INSERT FOR A SERVING TRAY
Gregory E. Herrick, 15612 Highway 7, Minnetonka, Minn. 55343
Filed Jan. 17, 1983, Ser. No. 458,489
Term of patent 14 years
U.S. Cl. D7—39

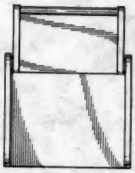


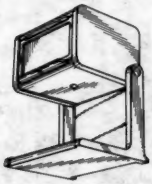
287,088
CONDIMENT MILL
William E. Bounds, 3737 W. 240th St., Torrance, Calif. 90505
Filed Aug. 29, 1984, Ser. No. 645,409
Term of patent 14 years
U.S. Cl. D7—53



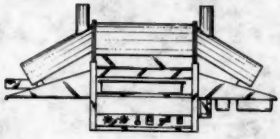
287,089
ELECTRIC BEVERAGE MAKER
William C. Cesaroni, Glenview, Ill., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 3, 1984, Ser. No. 637,444
Term of patent 14 years
U.S. Cl. D7—309





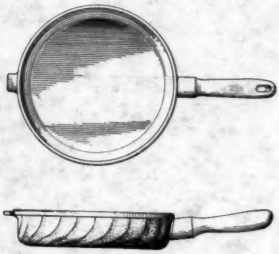


287,090
HUMPBACK TUNNEL OVEN-BROILER
Harold D. Wells, St. Louis County, Mo., assignor to Pet Incorporated, St. Louis, Mo.
Continuation-in-part of Ser. No. 380,553, May 21, 1982. This application May 10, 1984, Ser. No. 608,943
Term of patent 14 years
U.S. Cl. D7—323

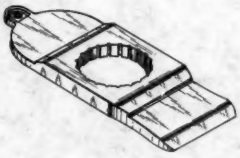


287,091
BARBECUE
Murray L. Elliston, 7064 Hillsboro St., San Diego, Calif. 92120
Filed Nov. 9, 1984, Ser. No. 670,165
Term of patent 14 years
U.S. Cl. D7—337

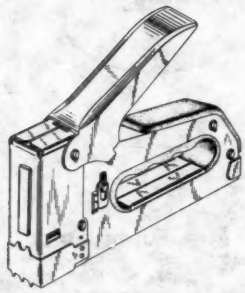
287,092
FRYING PAN OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510 Arques, France
Filed May 22, 1984, Ser. No. 612,883
Term of patent 14 years
U.S. Cl. D7—361



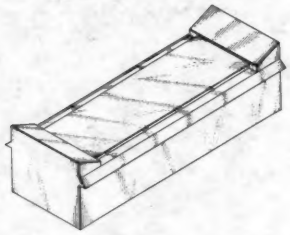
287,093
COMBINED BOTTLE CAP REMOVER, CAN OPENER AND ICE SCRAPER
Robert B. Ryan, 5025 Lillian St., Torrance, Calif. 90503
Filed Jul. 29, 1983, Ser. No. 518,657
Term of patent 14 years
U.S. Cl. D8—34



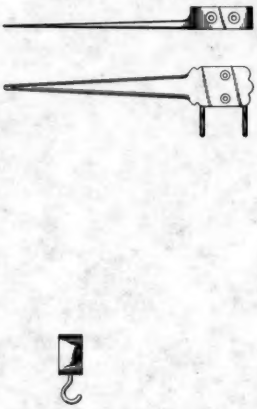
287,094
STAPLE GUN OR SIMILAR ARTICLE
Richard Jacoff, Mineola, N.Y., assignor to Great Neck Saw Manufacturers, Inc., Mineola, N.Y.
Filed May 21, 1984, Ser. No. 612,587
Term of patent 14 years
U.S. Cl. D8—49



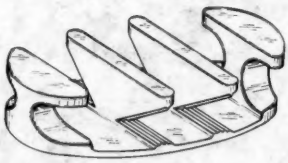
287,095
SHARPENING STONE HOLDER
James P. Hunter, Hot Springs, Ark., assignor to Kaman Sciences Corporation, Colorado Springs, Colo.
Filed Mar. 21, 1984, Ser. No. 591,814
Term of patent 14 years
U.S. Cl. D8—91



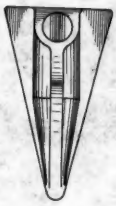
287,096
COMBINATION WALL MOUNTED ENVELOPE OPENER, PEN AND KEY CHAIN HOLDER
Richard L. Vitacco, 1653 Thurston Ave., Racine, Wis. 53405
Filed Mar. 8, 1984, Ser. No. 587,457
Term of patent 14 years
U.S. Cl. D8—102



287,097
CLEAT
Bruce D. Nelson, Minneapolis, Minn., assignor to Goldeneye Products, Inc., Minneapolis, Minn.
Filed Feb. 24, 1984, Ser. No. 583,409
Term of patent 14 years
U.S. Cl. D8—382

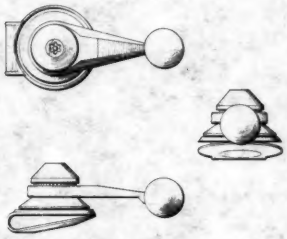


287,098
EARTH ANCHOR
Richard C. Wilson, Champlin, Minn., and Charles J. MacKarvich, Atlanta, Ga., assignors to Tie Down Engineering, Inc., Atlanta, Ga.
Filed Sep. 28, 1984, Ser. No. 655,243
Term of patent 14 years
U.S. Cl. D8—388

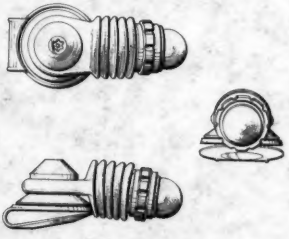


287,099
ELASTIC TIE DOWN STRAP
Milton T. Cory, Gastonia, N.C., assignor to Radiator Specialty Company, Harlotte, N.C.
Filed Dec. 5, 1984, Ser. No. 678,785
Term of patent 14 years
U.S. Cl. D8—394

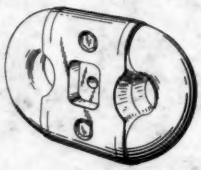
287,100
CLIP CONNECTOR FOR WINDSCREEN EXTENSIONS OR THE LIKE
Charles A. Saunders, IV, Box 1246, Columbus, Nebr. 68601
Filed Nov. 19, 1984, Ser. No. 672,676
Term of patent 14 years
U.S. Cl. D8—395

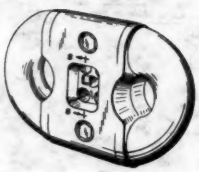


287,101
CLIP CONNECTOR FOR WINDSCREEN EXTENSIONS OR THE LIKE
Charles A. Saunders, IV, Box 1246, Columbus, Nebr. 68601
Filed Nov. 19, 1984, Ser. No. 672,678
Term of patent 14 years
U.S. Cl. D8—395

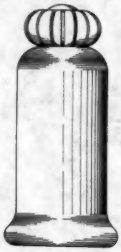


287,102
SEPARABLE CHAIN LINK
Rocco D. Albertini, Concordville, Pa., assignor to Baldt Incorporated, Chester, Pa.
Filed May 7, 1984, Ser. No. 607,761
Term of patent 14 years
U.S. Cl. D8—499

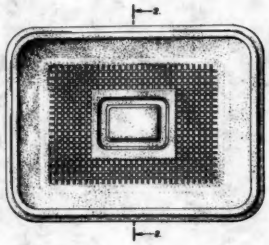




287,103
BOTTLE OR THE LIKE
Francois Thieffry, Paris, France, assignor to Societe d'Etudes de Chimie et de Therapie Appliques-Laboratoires de Cosmetologie Yves Rocher-S.E.C.T.A., Paris, France
Filed Jul. 20, 1984, Ser. No. 632,835
Claims priority, application France, Jan. 20, 1984, 840239
Term of patent 14 years
U.S. Cl. D9—352

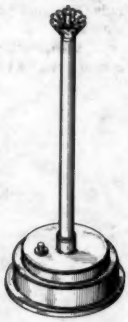


287,104
PACKAGING TRAY
M. James Holden, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed May 25, 1984, Ser. No. 614,209
Term of patent 14 years
U.S. Cl. D9—425



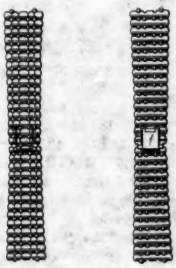
287,105
COMBINED PACKAGING AND DISPLAY CONTAINER
Ralph F. Osterhout, San Francisco, Calif., assignor to Tekna, Belmont, Calif.
Filed Jul. 24, 1984, Ser. No. 634,231
Term of patent 14 years
U.S. Cl. D9—415

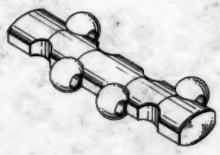
287,106
PORTABLE FLASHING SIGNAL LAMP
Thomas G. Wade, 3645 Birchbark Dr., Florissant, Mo. 63033
Filed Mar. 2, 1984, Ser. No. 585,826
Term of patent 14 years
U.S. Cl. D10—114



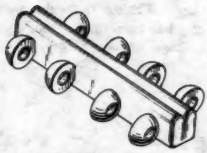
287,107
INDICATOR LENS
Ned Bergeron, and Theodore A. Stollberg, both of Houma, La., assignors to B.W.B. Controls, Inc., Houma, La.
Filed Mar. 28, 1983, Ser. No. 479,175
Term of patent 14 years
U.S. Cl. D10—121

287,108
WATCH BRACELET
Maurice Levene, London, England, assignor to Accurist S.A., Switzerland
Filed Nov. 30, 1984, Ser. No. 676,793
Claims priority, application Switzerland, Jun. 1, 1984, 113782
Term of patent 14 years
U.S. Cl. D11—4





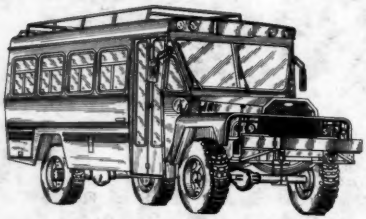
287,109
WATCH BRACELET
Maurice Levene, London, England, assignor to Accurist S.A., Switzerland
Filed Nov. 30, 1984, Ser. No. 676,792
Claims priority, application Switzerland, Jun. 1, 1984, 113782
Term of patent 14 years
U.S. Cl. D11—4



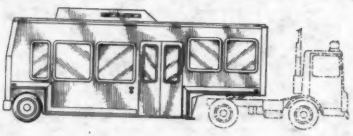
287,110
AQUATIC SCULPTURE OR SIMILAR ARTICLE
Otto Grun, 44 Cocoanut Row, Palm Beach, Fla. 33480
Filed May 7, 1984, Ser. No. 607,413
Term of patent 14 years
U.S. Cl. D11—158

287,111
DEER AND ELK SLEIGH
Donald Walker, 2679 S. Memphis Way, Aurora, Colo. 80013
Filed Mar. 12, 1984, Ser. No. 588,716
Term of patent 14 years
U.S. Cl. D12—6

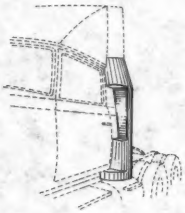
287,112
BUS VEHICLE
Paul Legueu, 85 avenue de Mazy, 44380 Pornichet, France
Filed Feb. 6, 1984, Ser. No. 577,386
The portion of the term of this patent subsequent to Feb. 7, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—84



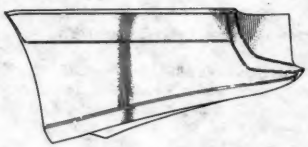
287,113
PASSENGER SEMITRAILER
Joseph M. FitzGerald, Buena Park, Calif., assignor to Superbus Associates, Buena Park, Calif.
Filed Sep. 25, 1984, Ser. No. 654,090
Term of patent 14 years
U.S. Cl. D12—97



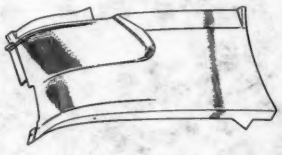
287,114
SIDE FAIRING
Donald R. Herpel, 29466 Candlewood, Southfield, Mich. 48076
Filed Dec. 4, 1984, Ser. No. 678,067
Term of patent 14 years
U.S. Cl. D12—181



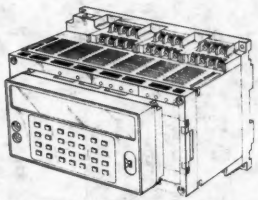
287,115
LEFT REAR SHIELD FOR ATTACHMENT TO AN AUTOMOBILE
Bjorn E. A. Envall, Vanersborg, Sweden, and Geoffrey P. Wardle, West Midlands, England, assignors to Saab-Scania Aktiebolag, Trollhattan, Sweden
Filed Apr. 24, 1984, Ser. No. 603,941
Claims priority, application Sweden, Oct. 26, 1983, 83-2775
Term of patent 14 years
U.S. Cl. D12—190



287,116
LEFT FRONT SHIELD FOR ATTACHMENT TO AN AUTOMOBILE
Bjorn E. A. Envall, Vanersborg, Sweden, and Geoffrey P. Wardle, West Midlands, England, assignors to Saab-Scania Aktiebolag, Trollhattan, Sweden
Filed Apr. 24, 1984, Ser. No. 603,956
Claims priority, application Sweden, Oct. 26, 1983, 83-2775
Term of patent 14 years
U.S. Cl. D12—190

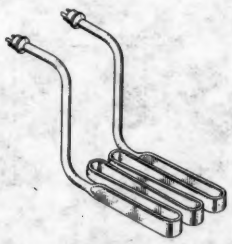


287,117
PROGRAMMABLE CONTROLLER
Tsukasa Saiki, Nakajo; Nobuyuki Kajima; Ryouichi Abe, both of Sibata, and Tatsuo Hujiwara, Nakajo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 9, 1984, Ser. No. 658,914
Term of patent 14 years
U.S. Cl. D13—12



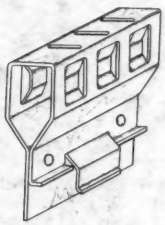
287,118
MARKING SLEEVE FOR ELECTRICAL CONDUCTORS OR THE LIKE
Lars Skarin, Otterbacken, Sweden, assignor to Partex Fabriksaktiebolag, Sweden
Filed May 8, 1984, Ser. No. 608,291
Claims priority, application Sweden, Feb. 3, 1984, 84-0347
Term of patent 14 years
U.S. Cl. D13—13

287,119
HEATING ELEMENT
Gurinder S. Wadia, Verdi, Nev., assignor to Wells Manufacturing Company, Verdi, Nev.
Filed Dec. 6, 1983, Ser. No. 558,511
Term of patent 14 years
U.S. Cl. D13—21

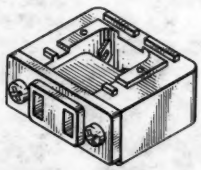


287,120
ELECTRONIC CHIP-CARRIER HEAT SINK
Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
Filed Mar. 29, 1985, Ser. No. 717,945
Term of patent 14 years
U.S. Cl. D13—23

287,121
SHEET-METAL HEAT SINK FOR ELECTRONIC DEVICES
Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
Filed Apr. 23, 1984, Ser. No. 602,748
Term of patent 14 years
U.S. Cl. D13—23

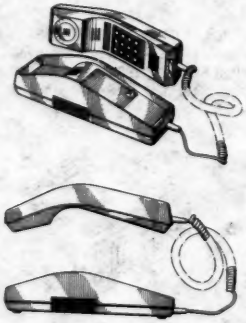


287,122
ADAPTER FOR CAMERA FLASH STROBE
Brent R. Hollister, 15848 Rayen St., Sepulveda, Calif. 91343
Filed Mar. 12, 1984, Ser. No. 588,442
Term of patent 14 years
U.S. Cl. D13—25

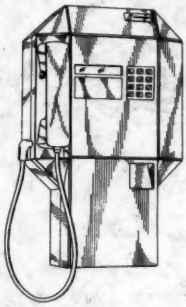


287,123
ELECTRICAL CONNECTOR
Saralee F. Ross, 25211 Stockport #313, Laguna Hills, Calif. 92653, and James R. Rydbeck, 3263 Old Bridgeport Way, San Diego, Calif. 92111
Filed Nov. 23, 1983, Ser. No. 554,976
Term of patent 14 years
U.S. Cl. D13—29

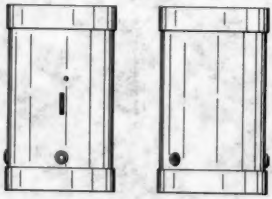
287,124
HANDSET TELEPHONE AND STAND UNIT
Peter Becker, Berlin, Fed. Rep. of Germany, assignor to Krone GmbH, Berlin, Fed. Rep. of Germany
Filed May 9, 1985, Ser. No. 732,414
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 36892
Term of patent 14 years
U.S. Cl. D14—53



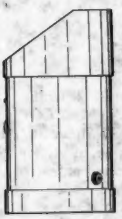
287,125
COIN-OPERATED TELEPHONE APPARATUS
Davorin Savnik, Ljubljana, Yugoslavia, assignor to Iskra-Sozd Electrokovinske Industrije N.Sol.O., Ljubljana, Yugoslavia
Filed Aug. 6, 1984, Ser. No. 638,009
Claims priority, application Yugoslavia, Feb. 6, 1984, 61/84
Term of patent 14 years
U.S. Cl. D14—55



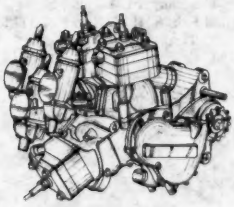
287,126
TELEPHONE AMPLIFIER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Ltd., Hong Kong, Hong Kong
Filed Jul. 10, 1984, Ser. No. 629,479
Claims priority, application United Kingdom, Jan. 19, 1984, 1017426
Term of patent 14 years
U.S. Cl. D14—57



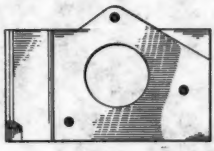
287,127
COMBINED TELEPHONE AMPLIFIER AND PEN HOLDER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Lmtd., Hong Kong, Hong Kong
Filed Jul. 5, 1984, Ser. No. 627,916
Claims priority, application United Kingdom, Jan. 19, 1984, 1017423
Term of patent 14 years
U.S. Cl. D14—57



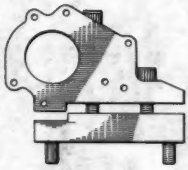
287,128
ENGINE FOR MOTORCYCLES
Kuniyuki Yamamoto, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 4, 1985, Ser. No. 740,967
Term of patent 14 years
U.S. Cl. D15—1



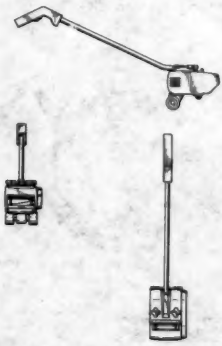
287,129
NOSE ADAPTER PLATE FOR AUTOMOBILE STARTERS
McLane Tilton, Jr., Solvang, Calif., assignor to Tilton Engineering, Inc., Buellton, Calif.
Filed Apr. 9, 1984, Ser. No. 598,450
Term of patent 14 years
U.S. Cl. D15—5



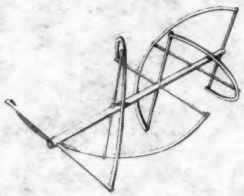
287,130
ADAPTER PLATE FOR AUTOMOBILE STARTERS
McLane Tilton, Jr., Solvang, Calif., assignor to Tilton Engineering, Inc., Buellton, Calif.
Filed Apr. 23, 1984, Ser. No. 603,284
Term of patent 14 years
U.S. Cl. D15—5



287,131
LAWN MOWER
Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Jul. 19, 1984, Ser. No. 632,303
Term of patent 14 years
U.S. Cl. D15—16

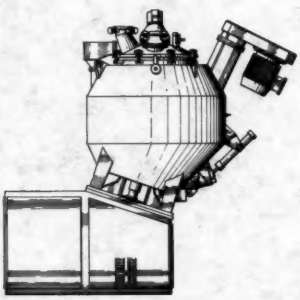


287,132
BLADE FOR SOIL MIXER
William A. Forbes, P.O. Box 1871, Westlock, Alberta T0G 2L0, Canada
Filed Feb. 15, 1985, Ser. No. 703,561
Term of patent 14 years
U.S. Cl. D15—19

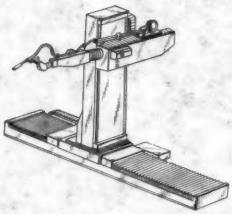


287,133
REFRIGERATOR
Roger W. Owen, 11809 Jefferson Pla., Omaha, Nebr. 68137
Filed Jul. 6, 1984, Ser. No. 628,487
Term of patent 14 years
U.S. Cl. D15—81

287,134
POT-TYPE MALAXATOR
Philippe Lappartient, 8, square Chanton, 92200 Neuilly-sur-Seine, France
Filed Jan. 28, 1983, Ser. No. 462,116
Term of patent 14 years
U.S. Cl. D15—122

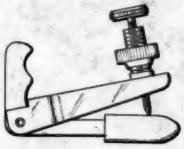


287,135
WELDING ROBOT
Ryoji Nagatani, Nagasaki, and Rikiya Iida, Takatsuki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 2, 1984, Ser. No. 606,454
Claims priority, application Japan, Feb. 3, 1984, 59-3790
Term of patent 14 years
U.S. Cl. D15—144



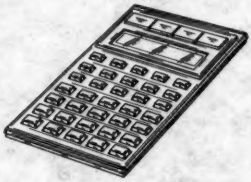
287,136
TELESCOPE
Joseph E. Murray, Jr., 27 Alpine St., #14, Malden, Mass. 02148
Filed Jan. 16, 1984, Ser. No. 570,870
Term of patent 14 years
U.S. Cl. D16—132

287,137
MUSICAL INSTRUMENT STRING ADJUSTER
James A. Bushman, St. Louis County, Mo., assignor to St. Louis Music Supply Company, St. Louis, Mo.
Filed Feb. 6, 1984, Ser. No. 577,522
Term of patent 14 years
U.S. Cl. D17—20

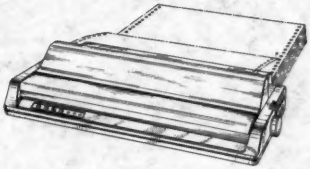


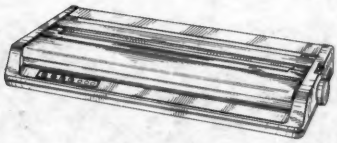
287,138
TYPEWRITER
Masakazu Sugiyama, and Kunio Akiyama, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 3, 1984, Ser. No. 607,011
Claims priority, application Japan, Nov. 7, 1983, 58-48438
Term of patent 14 years
U.S. Cl. D18—1

287,139
CALCULATOR
Shigeaki Hayashi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed May 3, 1984, Ser. No. 607,015
Claims priority, application Japan, Nov. 4, 1983, 58-47937
The portion of the term of this patent subsequent to Jun. 10, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—7

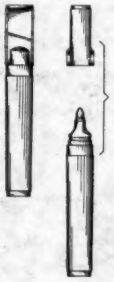


287,140
PRINTER FOR AN ELECTRIC CALCULATOR
Kazuo Yoshida, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jul. 26, 1984, Ser. No. 634,704
Term of patent 14 years
U.S. Cl. D18—12

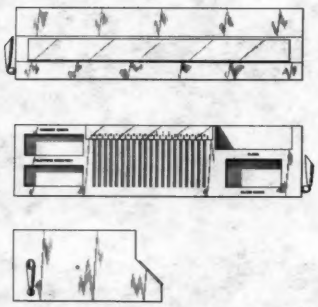




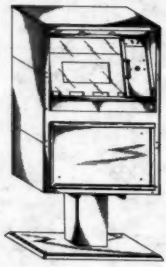
287,141
WRITING INSTRUMENT
Pierre Regnault, Valence, France, assignor to Etablissements Regnault, Valence, France
Filed Dec. 6, 1984, Ser. No. 678,978
Claims priority, application France, Jun. 6, 1984, 84 2518
Term of patent 14 years
U.S. Cl. D19—43



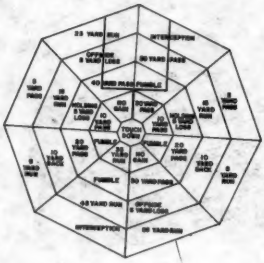
287,142
MEMORANDUM REMINDING DEVICE
Charles R. Goldman, Box 154, Evansville, Ark. 72729
Filed Apr. 18, 1984, Ser. No. 601,786
Term of patent 14 years
U.S. Cl. D19—75



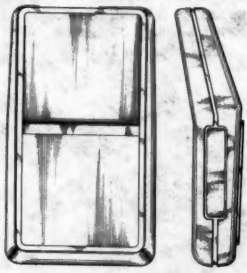
287,143
NEWSPAPER VENDING MACHINE
Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Company, Inc., Gardena, Calif.
Filed Nov. 25, 1983, Ser. No. 555,029
Term of patent 14 years
U.S. Cl. D20—6



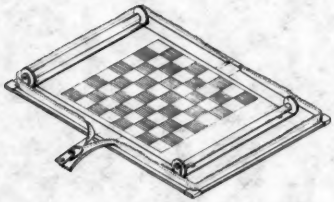
287,144
DART GAME BOARD
Matthew G. Dunn, 1637 Town St., Prentice, Wis. 54556
Filed Sep. 20, 1983, Ser. No. 534,086
Term of patent 14 years
U.S. Cl. D21—6



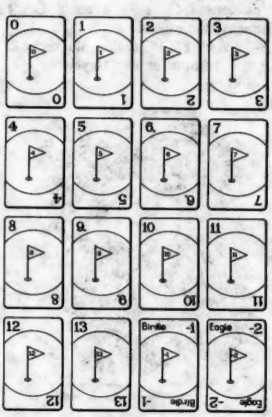
287,145
CASE FOR A PORTABLE COMPUTER GAME OR SIMILAR DEVICE
Albert R. Shilton, Los Angeles, and Greg L. DeSmet, Duarte, both of Calif., assignors to Avicom International, Inc., Pasadena, Calif.
Filed Oct. 9, 1984, Ser. No. 658,685
Term of patent 14 years
U.S. Cl. D21—13



287,146
COMBINED ROLLABLE CHESSBOARDS CLOTH AND ZIPPERED COVER THEREFOR
Tsung-Tzu Lin, 215, Sec. 2, chang Chiang Rd., Pan-Chiao City, Taipei Hsien, Taiwan
Filed Jan. 5, 1984, Ser. No. 568,464
Term of patent 14 years
U.S. Cl. D21—24



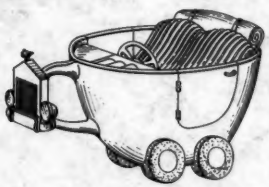
287,147
DECK OF PLAYING CARDS
Dorine M. Clapp, 547 Mulberry St., Clyde, Ohio 43410
Filed Sep. 7, 1984, Ser. No. 648,062
Term of patent 14 years
U.S. Cl. D21—43



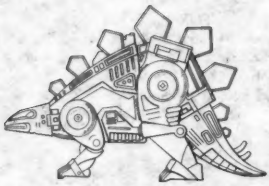
287,148
RATTLE
Peter G. Adams, Nether Stowey, England, assignor to Hestair Kiddicraft Limited, England
Filed Mar. 16, 1984, Ser. No. 590,267
Claims priority, application United Kingdom, Jan. 18, 1984, 1017390
Term of patent 14 years
U.S. Cl. D21—65

287,149
TOY RATTLE
Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Limited, Great Britain
Filed Feb. 19, 1985, Ser. No. 702,481
Term of patent 14 years
U.S. Cl. D21—65

287,150
SIMULATIVE TOY VEHICLE
Claude R. M. Moreau, 85-06 60th Ave., Elmhurst, N.Y. 11373
Filed Sep. 19, 1983, Ser. No. 533,250
Term of patent 14 years
U.S. Cl. D21—128



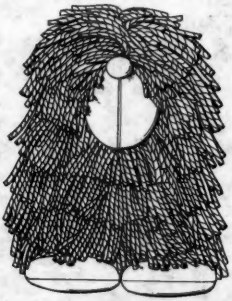
287,151
RECONFIGURABLE DINOSAURIAN TOY
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 30, 1984, Ser. No. 616,425
Claims priority, application Japan, Apr. 10, 1984, 59-14287
Term of patent 14 years
U.S. Cl. D21—148



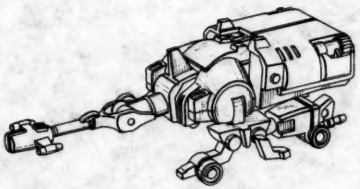
287,152
ANIMAL FIGURE
Linda D. Bussell, P.O. Box 30266, Honolulu, Hi. 96820
Filed Jun. 21, 1984, Ser. No. 622,956
Term of patent 14 years
U.S. Cl. D21—148

287,153
TOY SCUBA FIGURE
Tzi-Chan Choi, Kowloon, Hong Kong, assignor to Blue Box Toy Factory Limited, Hong Kong
Filed Apr. 25, 1984, Ser. No. 603,792
Claims priority, application United Kingdom, Nov. 14, 1983, 1016250
Term of patent 14 years
U.S. Cl. D21—150

287,154
DOLL OR SIMILAR ARTICLE
Carmen C. C. de Sanson, Calle San Ignacio, Qta Tanya, Prados del Este, Caracas, Venezuela
Filed Apr. 27, 1984, Ser. No. 605,622
Term of patent 14 years
U.S. Cl. D21—166

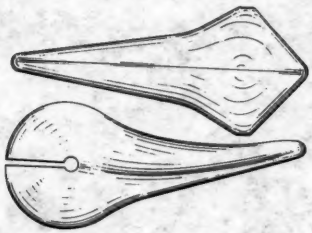


287,155
RECONFIGURABLE INSECT TOY
Takashi Matsuda, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Aug. 21, 1984, Ser. No. 643,264
Term of patent 14 years
U.S. Cl. D21—185



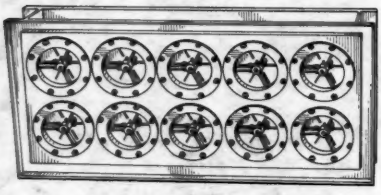
287,156
STAKE
Leo Sloane, Syosset, N.Y., assignor to Regent Sports Corporation, Hauppauge, N.Y.
Filed May 14, 1984, Ser. No. 609,859
Term of patent 14 years
U.S. Cl. D21—255

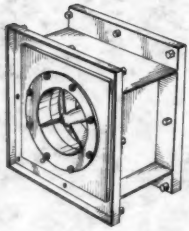
287,157
MOUTH-TOUCHING BOWSTRING-HELD ANCHOR NOCK FOR ARCHERY
Peter R. Griz, 2655 Baldwin, Oxford, Mich. 48051
Filed Jul. 26, 1983, Ser. No. 517,336
Term of patent 14 years
U.S. Cl. D22—107



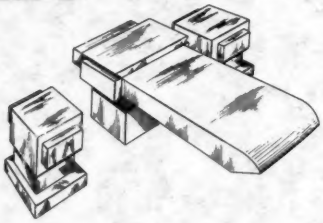
287,158
GUN BUTT PLATE
Henry P. Anderson, 21297 Hoekstra Ct., North, Forest Lake, Minn. 55025
Filed Apr. 16, 1984, Ser. No. 600,779
Term of patent 14 years
U.S. Cl. D22—111

287,159
VALVE FOR EQUALIZING PRESSURE RESULTING FROM EXPLOSIONS OR BLASTS
Matti Purhonen, Helsinki, Finland, assignor to Temet Oy, Helsinki, Finland
Filed Jan. 6, 1983, Ser. No. 455,997
Claims priority, application Finland, Jul. 6, 1982, 589/82
Term of patent 14 years
U.S. Cl. D23—21





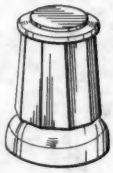
287,160
PAIR OF FAUCET HANDLES AND SPOUT SET
Manfred Rademacher, Freiligrathstrasse 19a, 4 Düsseldorf, Fed. Rep. of Germany
Filed Feb. 29, 1984, Ser. No. 584,810
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1983, M.R.5267
Term of patent 14 years
U.S. Cl. D23—25



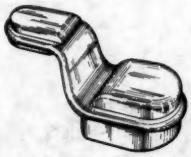
287,161
FAUCET HANDLE
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Milan, Italy
Filed Apr. 24, 1984, Ser. No. 603,376
Term of patent 14 years
U.S. Cl. D23—28

287,162
FAUCET HANDLE
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Milan, Italy
Filed Apr. 24, 1984, Ser. No. 603,387
Term of patent 14 years
U.S. Cl. D23—28

287,163
FAUCET HANDLE
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Milan, Italy
Filed Apr. 24, 1984, Ser. No. 603,386
Claims priority, application Italy, Dec. 6, 1983, 23770B/83
Term of patent 14 years
U.S. Cl. D23—28

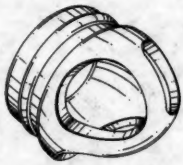


287,164
FAUCET HANDLE
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Milan, Italy
Filed Apr. 24, 1984, Ser. No. 603,377
Term of patent 14 years
U.S. Cl. D23—29

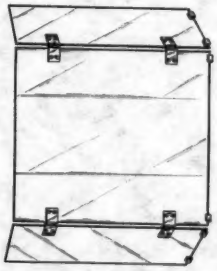


287,165
SURGICAL SUCTION DEVICE
Steven J. Lipsky, Pimento Cove, Reading P.O., St. James, Jamaica, and John D. Dale, 6005 Lincoln Dr., Scottsdale, Ariz. 85253
Filed May 4, 1984, Ser. No. 607,133
Term of patent 14 years
U.S. Cl. D24—51

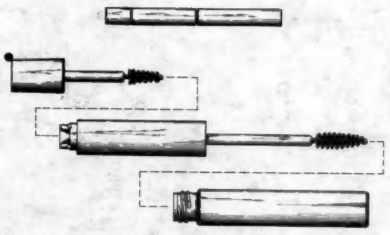
287,166
TIP GUARD FOR A SURGICAL SUCTION DEVICE
Steven J. Lipsky, Pimento Cove, Reading P.O., St. James, Jamaica, and John D. Dale, 6005 Lincoln Dr., Scottsdale, Ariz. 85253
Filed May 4, 1984, Ser. No. 607,134
Term of patent 14 years
U.S. Cl. D24—51



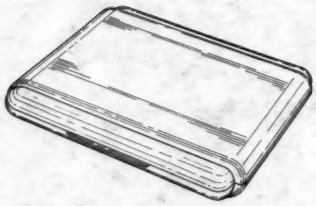
287,167
FIREPLACE SCREEN
Joseph J. Catania, deceased, late of Cheshire, Conn. by Hilda B. Catania, co-executor; Conn. National Bank, co-executor, New Haven, Conn.; Angelo Gaudino, Wallingford, Conn.; Russell DeTuzzi, Huntington, Conn., and Maxwell Gardner, Wallingford, Conn., assignors to Century Fireplace Furnishings, Inc., Wallingford, Conn.
Filed Apr. 6, 1984, Ser. No. 597,740
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—138.3



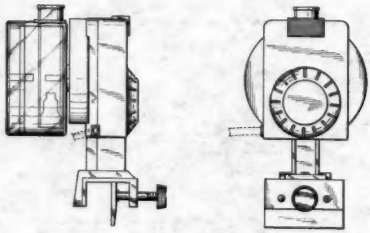
287,168
MASCARA APPLICATOR BOTTLE
Ted Kingsford, Memphis; Robert Baumgartner, Bartlett, and Sheila Rose, Memphis, all of Tenn., assignors to Plough, Inc., Memphis, Tenn.
Filed Aug. 16, 1984, Ser. No. 641,148
Term of patent 14 years
U.S. Cl. D28—77



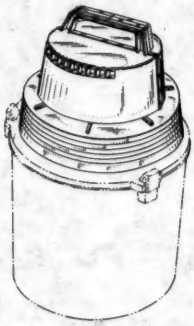
287,169
COSMETIC CASE
Roberto Trabattoni, Petit-Lancy, Switzerland, assignor to Trasti S.A., Petit-Lancy, Switzerland
Filed Dec. 30, 1983, Ser. No. 567,360
Term of patent 14 years
U.S. Cl. D28—83



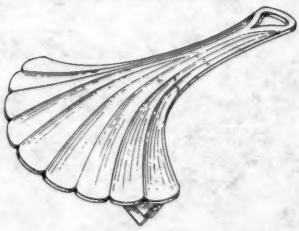
287,170
AUTOMATIC AQUARIUM FEEDER
Jerome Goldman, New York; Marvin Goldman, Great Neck; Gerald Phillips, Glen Cove, and Joseph Pesin, Brooklyn, all of N.Y., assignors to Penn Plax Plastics, Inc., Garden City, N.Y.
Filed Dec. 21, 1984, Ser. No. 685,139
Term of patent 14 years
U.S. Cl. D30—12



287,171
MOTOR HOUSING FOR CANISTER TYPE ELECTRIC VACUUM CLEANER
Robert C. Berfield, Jersey Shore; Ronald F. Meland, Muncy, and Robert L. Crevling, Jr., Williamsport, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Jan. 17, 1984, Ser. No. 571,562
Term of patent 14 years
U.S. Cl. D32—25

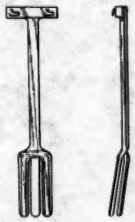


287,172
SQUEEGEE
Jo Ann Fulanovich, 7338 S. Rockwell, Chicago, Ill. 60629
Filed Sep. 27, 1984, Ser. No. 655,166
Term of patent 14 years
U.S. Cl. D32—41

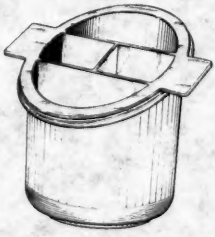


287,173
LIQUID APPLICATOR
Robert J. Libman, Champaign, Ill., assignor to Libman Broom Company, Arcola, Ill.
Filed May 3, 1984, Ser. No. 606,869
Term of patent 14 years
U.S. Cl. D32—51

287,174
BUCKET MOUNTABLE MOP HANGER
John DiFede, 24878 Tioga Rd., Hayward, Calif. 94544
Filed Jun. 11, 1984, Ser. No. 619,537
Term of patent 14 years
U.S. Cl. D32—54



287,175
CUTLERY DRAINER
Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Dec. 27, 1983, Ser. No. 565,712
Term of patent 14 years
U.S. Cl. D32—55



287,176
COLLECTING CONTAINER FOR WASTE MATERIALS
Josephus N. M. Kouwenhoven, Dresdenlaan 25, NL-3055 WD Rotterdam, Netherlands
Filed May 16, 1984, Ser. No. 610,654
Term of patent 14 years
U.S. Cl. D34—9

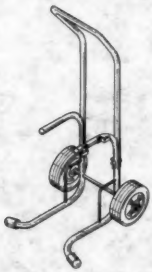
287,177
CART
Victor R. Spicer, Auckland, New Zealand, assignor to Planhorse International NZ Limited, Auckland, New Zealand
Filed Aug. 13, 1984, Ser. No. 640,406
Claims priority, application New Zealand, Feb. 13, 1984, 18916
Term of patent 14 years
U.S. Cl. D34—21

287,178

CART FOR A DRAIN CLEANING MACHINE

Larry F. Babb, LaGrange, and Charles A. Boise, Wellington, both of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 23, 1984, Ser. No. 592,514
Term of patent 14 years
U.S. Cl. D34—24



287,179

LUG WRENCH SUPPORT STAND OR SIMILAR ARTICLE

Roy E. Kuykendall, 45-425 Ash Ave., Indio, Calif. 92201

Filed May 14, 1984, Ser. No. 609,813
Term of patent 14 years
U.S. Cl. D34—31

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TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF DECEMBER, 1986

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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AB Mekania-Verken: *See—*
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on a digital transmission link without interrupting traffic. 4,628,309, Cl. 340-825.540.

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Amax Inc.: *See—*
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Auer, Peter. Step-negotiating vehicle. 4,627,508, Cl. 180-9.220.
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Aughton, John E.; and Oldershaw, Robert J., to Crosfield Electronics (USA) Limited. Image enhancement. 4,628,350, Cl. 358-75.000.
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Azusawa, Noboru; and Shiraishi, Hisayoshi, to Hitachi, Ltd. Pulse width modulation pulse generator. 4,628,475, Cl. 364-851.000.
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Baer, John S., to RainWise, Inc. Magnet selector or switch. 4,627,277, Cl. 73-170.00R.
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Balderes, Demetrios; Frankovsky, Andrew J.; and Jarvela, Robert A., to International Business Machines Corporation. Apparatus for directly powering a multi-chip module from a power distribution bus. 4,628,411, Cl. 361-414.000.
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Barr, A. Brinkley; and Edwards, D. Craig, to Baker International Corporation. Liquid level detection system. 4,628,302, Cl. 340-620.000.

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Bartlow, David H., to Owens-Corning Fiberglas Corporation. Pultruded underground tank hold-down strap assembly. 4,627,133, Cl. 24-298.000.

Basa, Laddie A., to Andrew Corporation. Television transmission system using overmoded waveguide. 4,628,538, Cl. 455-91.000.

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Bayless, Ernest O.: *See—*
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Beaulieu, Bryan J. Hub assembly for collapsible structure. 4,627,210, Cl. 52-646.000.

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Beaver, Earl R.; Lester, J. Harvey, Jr.; and Thompson, Thomas J., to Monsanto Company. Process for preparing a polyamide. 4,627,940, Cl. 260-501.110.

Beavers, John A., to International Business Machines Corporation. Infra-red data communications system for coupling a battery powered data entry device to a microcomputer. 4,628,541, Cl. 455-603.000.

Bechtel, Friend K., to Metriguard, Inc. Apparatus for tension testing of lumber. 4,627,293, Cl. 73-831.000.

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Bedi, James J.; Golden, Donald M.; and McVay, William P., to Ethicon, Inc. Method of applying a fastener to tissue with a pair of hollow needles. 4,627,437, Cl. 128-334.00C.

BEI Motion Systems Company, Inc.: *See—*
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Beitner, Shlomo, to Vapor Corporation. Thermoelectric cooler. 4,627,242, Cl. 62-3.000.

Belart, Juan; Weise, Lutz; and Seibert, Wolfram, to Alfred Teves GmbH. Slip-controlled brake system for automotive vehicles. 4,627,669, Cl. 303-114.000.

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Benz, Willi, to SMS Sloemann Siegmag AG. Rolling stand with axially shiftable rolls. 4,627,260, Cl. 72-247.000.

Berenjian, Karim, to Ford Motor Company. Energy absorbing steering column for motor vehicles. 4,627,306, Cl. 74-492.000.

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Bergemann, David; Figler, Alan A.; Lamadrid, Rene; Pernic, Stanley; and Selman, John J., to Baxter Travenol Laboratories, Inc. Heater-scale for heating fluids for injection into a patient. 4,628,186, Cl. 219-497.000.

Bergere, Emric W. Article for treating soil around growing plants. 4,627,191, Cl. 47-25.000.

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Berndt, Dale F., to Sperry Corporation. Fast scan/set testable latch using two levels of series gating with one current source. 4,628,217, Cl. 307-467.000.

Bernheim, Michael; Meindl, Hubert; Rohringer, Peter; Wegmuller, Hans; and Werthemann, Dieter, to Ciba-Geigy Corporation. Process for sizing paper with anionic hydrophobic sizing agents and cationic retention aids. 4,627,889, Cl. 162-158.000.

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Berolina International Marketing Strategie GmbH: *See*—
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Berthet, Aristide; and Denier, Guy, to IRSID. Installation for the production of steel by pre-smelting of pig iron. 4,627,601, Cl. 266-212.000.

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Bhate, Suresh K. Combined mechanical and magnetic locking system. 4,627,251, Cl. 70-276.000.

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Billette de Villemeur, Philippe M.; Pournain, Gerard L.; and Cahu, Louis A., to Establissements A. Gregoire & Barilleau. Continuous-accessibility electrical conduits. 4,627,679, Cl. 339-21.00R.

Bingo, Hideyuki; Yoshimura, Takashi; Yamashita, Masatsuga; Hashizume, Shinichi; and Iwakiri, Norio, to Omron Tateisi Electronics Co. Sealed slide switch. 4,628,166, Cl. 200-302.100.

Bird, Kenneth J. H.; Cross, Robert J.; and Singh, Manjit, to Diversey Corporation. Method and apparatus for treating a plurality of zones of a processing line. 4,627,457, Cl. 137-1.000.

Birrittella, Mark S.; Marley, Robert R.; and Nootbaar, Keith D., to Motorola, Inc. NPN bandgap voltage generator. 4,628,248, Cl. 323-314.000.

Biswas, Ranjit, to Thomas & Betts Corporation. Electronic package assembly and accessory component therefor. 4,627,678, Cl. 339-17.0CF.

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Block, Richard M. Infant article suspension structure. 4,627,588, Cl. 248-163.200.

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Bond, Robert H.: *See*—
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Bone, Arnold R., to Dennison Manufacturing Company. Operation of trigger actuated devices. 4,627,562, Cl. 227-67.000.

Bonnell, Leo W.; and Pietrantonio, Joseph M., to Air Products and Chemicals, Inc. Process for the production of methanol. 4,628,066, Cl. 518-700.000.

Bor, Jan H. Stairlift. 4,627,517, Cl. 187-12.000.

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Borg, Arthur N.; and Bar-Hai, Giora, to Zenith Electronics Corporation. Terminal with memory write protection. 4,628,479, Cl. 364-900.000.

Borgner, Klaus, to Luco-Technic GmbH Verfahrenstechische Anlagen. Bag cutting-and emptying-device with connected collective dust-removal filter. 4,627,781, Cl. 414-412.000.

Bork, Jonathan: *See*—
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Borsotti, Giampiero, to Montedison S.p.A. Process for the synthesis of 2-methoxy-6-bromo-naphthalene. 4,628,123, Cl. 568-634.000.

Borth, David E.; Gerson, Ira A.; and Vilmur, Richard J., to Motorola, Inc. Noise suppression system. 4,628,529, Cl. 381-94.000.

Boschert Inc.: *See*—
Small, Kenneth T., 4,628,432, Cl. 363-56.000.

Bose, Amar G.; and Short, William R., to Bose Corporation. Pressure wave transducing. 4,628,528, Cl. 381-90.000.

Bose Corporation: *See*—
Bose, Amar G.; and Short, William R., 4,628,528, Cl. 381-90.000.

Botsolas, Carol: *See*—
Botsolas, Chris J., 4,627,995, Cl. 428-43.000.

Botsolas, Chris J., to Botsolas, Carol. Fiberglass insulation wrap for insulating a pipe elbow. 4,627,995, Cl. 428-43.000.

Bottiau, Michel, to U.S. Philips Corporation. System for generating tricolor video signals, such as a game, and a removable cartridge intended for such a system. 4,628,304, Cl. 340-703.000.

Bottman, Jeffrey S., to John Fluke Mfg. Co., Inc. Low even-order harmonic distortion amplifier and method. 4,628,278, Cl. 330-149.000.

Botzem, Werner; and Schlich, Elmar, to Transnuclear GmbH. Shock absorbers. 4,627,956, Cl. 376-272.000.

Boue, Philippe, to Thomson CSF. Device for correcting video signals in a system for acquistion and scanning of fast signals involving the use of a streak camera. 4,628,352, Cl. 358-93.000.

Boulard, Pierre; and Gouriou, Roger, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Data and signaling time slot transfer and processing system for a set of multiplex lines. 4,628,502, Cl. 370-84.000.

Bourgois, Luc, to N.V. Bekaert S.A. Compact steel cord for improved tensile strength. 4,627,229, Cl. 57-213.000.

Bourguignon, Anna-Luise: *See*—
Badenhop, Charles T.; Bourguignon, Anna-Luise; and Fischer, Joachim, 4,627,992, Cl. 427-244.000.

Bournonville, Jean-Paul; Candy, Jean-Pierre; and Mabilon, Gil, to Institut Francais du Petrole. Process for producing alcohols by hydrogenolysis of carboxylic acid esters in the presence of a catalyst containing nickel and tin, germanium or lead. 4,628,130, Cl. 568-885.000.

Boutni, Omar M., to General Electric Company. Polycarbonate compositions. 4,628,074, Cl. 525-146.000.

Bowen, Linwood H.: *See*—
Sudbrack, Cecil R.; Bowen, Linwood H.; and Bigelow, Donald O., 4,627,341, Cl. 100-41.000.

Bowes, H. David; and Kuhn, Edward S., to Thompson-Chemtrex, Inc. Portable pump with air seal. 4,627,790, Cl. 415-53.00R.

Bowser, Donald M., to Truswal Systems Corporation. Apparatus for forming a truss assembly. 4,627,564, Cl. 227-152.000.

Boyd, Robert T.: *See*—
Sager, John C.; Odam, Kenneth D.; Boyd, Robert T.; and Dell, Peter W., 4,628,508, Cl. 371-9.000.

Boyle, Richard C., to System Development Corporation. Visual monitor for electrical signals. 4,628,303, Cl. 340-661.000.

Brachert, Heinrich; Girke, Dieter; and Kellner, Gerd, to Dynamit Nobel Aktiengesellschaft. Single- or multiple-base powder charges for propellants and process for their manufacture. 4,627,352, Cl. 102-290.000.

Brackmann, Warren A.; and Snaidr, Stanislav M., to Rothmans of Pall Mall Canada Limited. Tobacco winnowing method and apparatus. 4,627,447, Cl. 131-109.100.

Bradford-White Corporation: *See*—
West, Eugene L., 4,628,184, Cl. 219-312.000.

Bradley, Earl T., to Ebaa Iron Inc. Limiting torque bolt-nut assembly. 4,627,774, Cl. 411-5.000.

Bradley, James; Evans, George E.; Mackenzie, Donald; and Marcuson, Michael, to Empra Systems Corp. Helicopter rescue device. 4,627,821, Cl. 441-83.000.

Bradley, James D.: *See*—
Deitch, James C.; Kemppainen, Nels E.; Bradley, James D.; and Pfeffer, George B., 4,628,159, Cl. 200-51.050.

Bradus, Robert, to Black & Decker Inc. Microprocessor based motor control. 4,628,233, Cl. 318-306.000.

Brady, William A., Jr.; Jordan, Stanley R.; Morgado, Eugenio J.; Perlini, Julius J.; and Stricker, Alfred A., to International Business

Machines Corporation. Centerfold forming apparatus for a disk envelope. 4,627,829, Cl. 493-189.000.

Brandes, Wilhelm: *See*—
Gayer, Herbert; Kramer, Wolfgang; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,628,060, Cl. 514-432.000.

Brandner, Burkhard; Schilly, Helmut; Stubs, Albert; and Stojek, Dieter, to Atlas Fahrzeugtechnik GmbH; and Ford-Werke AG. High-velocity carburetor for an Otto engine. 4,627,401, Cl. 123-439.000.

Braun, Kenneth H.; and Perlmutter, Michael S., to Raytheon Company. Mode discrimination apparatus. 4,627,732, Cl. 356-350.000.

Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, to Wabco Westinghouse Steuerungstechnik GmbH & Co. Valve activation apparatus. 4,627,597, Cl. 251-129.030.

Brdr. Skov A/S: *See*—
Veng, Niels S., 4,627,506, Cl. 177-25.000.

Breithaupt, Udo: *See*—
Langen, Arnold; Benecke, Herta; and Breithaupt, Udo, 4,627,880, Cl. 127-43.000.

Breuckmann, Bernd; and Thieme, Werner, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Differential holographic method. 4,627,729, Cl. 356-347.000.

Bridgestone Corporation: *See*—
Araki, Yusuke, 4,627,884, Cl. 156-131.000.

Briere, Richard L., to Dennison Manufacturing Company. Mica-electrode laminations for the generation of ions in air. 4,628,227, Cl. 315-111.810.

Brieu, Francois, to Chleq Frote et Cie. Drying cylinder for a web material machine, particularly a paper machine. 4,627,176, Cl. 34-115.000.

Brigham, Dana P.: *See*—
Haines, Harold G.; and Dickens, Caroline B., 4,628,063, Cl. 514-626.000.

Bristol, L. Rodney, to Tektronix, Inc. Method for digitally measuring waveforms. 4,628,254, Cl. 324-77.00R.

Bristow, Raymond E.; Fitzpatrick, Michael; and Groom, David C., to Fairford Electronics Limited. Start-up control method and apparatus for polyphae induction motor. 4,628,241, Cl. 318-778.000.

British Gas Corporation: *See*—
Parkes, Adrian S.; Corbett, Gordon J.; Clough, Peter S.; and Barker, Colin N. H., 4,627,471, Cl. 138-97.000.

British Petroleum Company p.l.c., The: *See*—
Kelly, Felix T.; Newey, David C.; and Sutton, Gordon W., 4,627,812, Cl. 431-7.000.

British Telecommunications: *See*—
Sager, John C.; Odam, Kenneth D.; Boyd, Robert T.; and Dell, Peter W., 4,628,508, Cl. 371-9.000.

Brixy, Heinz; and Hoewener, Hubert, to Kernforschungsanlage Julich GmbH. Temperature sensor utilizing thermal noise and thermal couple elements, and associated connecting cable. 4,627,744, Cl. 374-175.000.

Broersma, Lester V., to Bell Helmets Inc. Ventilated helmet. 4,627,115, Cl. 2-425.000.

Brooker, Doris C., to University of Minnesota, Regents of the. Device for sampling tissues and fluids from bodily cavities. 4,627,444, Cl. 128-758.000.

Brooks, David A. Child restraint device with removable semi-rigid support. 4,627,428, Cl. 128-135.000.

Brooks, Robert B., to General Electric Company. Ice dispenser for a household refrigerator. 4,627,556, Cl. 222-240.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Mizuno, Kenji; and Sasaki, Ryoichi, 4,627,748, Cl. 400-17.000.

Brotz, Gregory R. Manufacturing process for a plated carbonized resin-coated paper structure. 4,627,895, Cl. 204-20.000.

Brotz, Gregory R. Foamed nuclear cell. 4,628,143, Cl. 136-253.000.

Broussard, Curtis: *See*—
Viator, Carrol L.; Gilley, Glenn E.; Broussard, Paul C., Sr.; Broussard, Curtis; and Gracy, Dennis, 4,627,922, Cl. 210-704.000.

Broussard, Paul C., Sr.: *See*—
Viator, Carrol L.; Gilley, Glenn E.; Broussard, Paul C., Sr.; Broussard, Curtis; and Gracy, Dennis, 4,627,922, Cl. 210-704.000.

Brown, Alfred R.; and Whetton, Richard A., to Graviner Limited. Electrical circuit arrangements. 4,628,301, Cl. 340-584.000.

Brown, Boveri & Cie AG: *See*—
Grams, Timm; Deck, Werner; Figge, Johannes; and Siebert, Hartmut, 4,628,503, Cl. 370-85.000.

Brown, Clarence. Vehicle anti-theft device. 4,627,514, Cl. 180-287.000.

Brown, David E.: *See*—
Tate, Joseph B.; and Brown, David E., 4,628,299, Cl. 340-540.000.

Brown International Corporation: *See*—
Bushman, Ronald C., 4,627,339, Cl. 99-540.000.

Brown, Jeffrey R., to Honeywell Inc. Distributed bus control communication protocol. 4,628,504, Cl. 370-85.000.

Brown, Martin R.: *See*—
Glover, Rodney; and Brown, Martin R., 4,628,078, Cl. 526-303.100.

Brown, Mary J.: *See*—
Barnett, Kenneth W.; and Brown, Mary J., 4,628,138, Cl. 585-531.000.

Bruce, Peter, to Brupat Limited. Link chain. 4,627,232. Cl. 59-84.000.

Brunam Controle Sarl: *See*—
Leplat, Robert, 4,627,649, Cl. 292-92.000.

Bruning, Gert W.; and Fellows, Mark W., to North American Philips Corporation. High frequency high voltage power supply preventing simultaneous transistor conduction. 4,628,284, Cl. 331-86.000.

Brupat Limited: *See*—
Bruce, Peter, 4,627,232, Cl. 59-84.000.

Bruss, Karl-Heinz; and Baumgartner, Hans, to Pierburg GmbH & Co. KG. Apparatus for the angular adjustment of a shaft, such as a camshaft, with respect to a drive wheel. 4,627,825, Cl. 464-2.000.

Buard, Yvon, to Legrand. Composite structure duct. 4,627,469, Cl. 138-92.000.

Buchanan, Alan S.: *See*—
Johns, Reginald B.; Chaffee, Alan L.; Cain, David A.; and Buchanan, Alan S., 4,627,575, Cl. 241-15.000.

Buchar, Wayne A.: *See*—
Nguyen, Tuan A.; Sosinski, Ronald T.; and Buchar, Wayne A., 4,627,721, Cl. 355-77.000.

Buchner, Norbert, to Robert Bosch GmbH. Method for producing sterile packages. 4,627,221, Cl. 53-425.000.

Buczkowski, Louis. Two-piece booster shot shell wad. 4,627,356, Cl. 102-453.000.

Buhler, Fritz, to Les Fils d'Auguste Scheuchzer, S.A. Method for the renewal of a railroad switch or crossing and train for carrying out the method. 4,627,359, Cl. 104-3.000.

Buice, Jack E., to Dow Chemical Company, The. Combustion of halogenated hydrocarbons with heat recovery. 4,627,388, Cl. 122-149.000.

Bulso, Joseph D., Jr.; and McClung, James A., to Redicon Corporation. Double action conversion system. 4,627,265, Cl. 72-354.000.

Buonomo, Joseph P.; Losinger, Raymond E.; Oliver, Burton L.; and Sucher, Daniel J., to International Business Machines Corporation. Apparatus and method for synchronization of peripheral devices via bus cycle alteration in a microprocessor implemented data processing system. 4,628,445, Cl. 364-200.000.

Burger, Dale R., to California Institute of Technology. Method for contact resistivity measurements on photovoltaic cells and cell adapted for such measurement. 4,628,144, Cl. 136-256.000.

Burgess, Trevor M.; and Lesso, William G., Jr., to Schlumberger Technology Corporation. Method for measuring bit wear during drilling. 4,627,276, Cl. 73-151.000.

Burke Company, The: *See*—
Francies, Sidney E., III, 4,627,198, Cl. 52-125.500.

Burke, James E., to Wescott Steel, Inc. Method of making pin with manganese steel shroud. 4,627,144, Cl. 29-447.000.

Burke, Thomas W.: *See*—
Klee, David J.; Burke, Thomas W.; and Miller, Scott A., 4,627,197, Cl. 51-319.000.

Burnett, David W., to AT&T Technologies, Inc. Tool for inserting cable wires in connector contacts. 4,627,150, Cl. 29-566.400.

Burron Medical Inc.: *See*—
Raines, Kenneth C., 4,627,843, Cl. 604-263.000.

Burroughs Corporation: *See*—
Mathamel, Flavius A., 4,628,325, Cl. 346-1.100.

Burrows, James L., to Sanders Associates, Inc. Programmable push-pop memory stack. 4,628,477, Cl. 364-900.000.

Burrows, Roger I., to Price/Stern/Sloan Publishers, Inc. Teaching or amusement apparatus. 4,627,819, Cl. 434-337.000.

Burt, Edward A.: *See*—
Holmes, Silas W.; Burt, Edward A.; and Goins, Dixie E., 4,628,127, Cl. 568-781.000.

Busacchi, Pietro, to Weber S.p.A. Electromagnetically-controlled valve, suitable for controlling an additional air flow in a feed equipment for an internal combustion engine. 4,627,596, Cl. 251-129.070.

Buschmann, Ernst: *See*—
Acker, Rolf-Dieter; Buschmann, Ernst; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,628,048, Cl. 514-63.000.

Buser, Rudolph G.: *See*—
Nomiyama, Neal T.; Rohde, Robert S.; and Buser, Rudolph G., 4,628,542, Cl. 455-619.000.

Bushman, Ronald C., to Brown International Corporation. Apparatus for removing skins and pits from avocados and the like. 4,627,339, Cl. 99-540.000.

Butler, John C.: *See*—
Kuehnle, Manfred; Cahill, Lysle D.; Butler, John C.; and Bassuk, Lawrence J., 4,628,367, Cl. 358-285.000.

Butt, Andrew R., to Coal Industry (Patents) Limited. Hot gas generation. 4,627,367, Cl. 110-347.000.

Butterworth, Robert M.; Martin, John R.; and Willis, Edwin, to Lever Brothers Company. Aqueous concentrated fabric softening composition. 4,627,925, Cl. 252-8.800.

Buyak, William P., to General Signal Corporation. Electronic circuits for driving bells or electromagnetic devices. 4,628,213, Cl. 307-80.000.

Buysch, Hans-Josef; Kussi, Siegfried; and Boehmke, Gunther, to Bayer Aktiengesellschaft. Stabilized lubricants based on polyethers. 4,627,929, Cl. 252-47.000.

B.V. Optische Industrie de Oude Delft: *See*—
Heflin, Chester L., 4,628,523, Cl. 378-193.000.

Byrne, Barry F., to Wormald International Ltd. Stop valve alarm for sprinkler system. 4,627,497, Cl. 169-23.000.

C.A. Weidmuller GmbH & Co.: *See*—
Wiebe, Ulrich; and Wilmes, Manfred, 4,627,314, Cl. 81-9.430.

C. & T. Tarlton, Inc.: *See*—
Tarlton, Curtis S.; and Ford, Richard A., 4,627,529, Cl. 198-778.000.

Cahill, Lysle D.: *See*—
Kuehnle, Manfred; Cahill, Lysle D.; Butler, John C.; and Bassuk, Lawrence J., 4,628,367, Cl. 358-285.000.
Cahu, Louis A.: *See*—
Billette de Villemeur, Philippe M.; Pournain, Gerard L.; and Cahu, Louis A., 4,627,679, Cl. 339-21.00R.
Cain, David A.: *See*—
Johns, Reginald B.; Chaffee, Alan L.; Cain, David A.; and Buchanan, Alan S., 4,627,575, Cl. 241-15.000.
Calgon Carbon Corporation: *See*—
Sutt, Robert F., Jr., 4,627,857, Cl. 55-70.000.
California Institute of Technology: *See*—
Burger, Dale R., 4,628,144, Cl. 136-256.000.
Camaggi, Giovanni; Gozzo, Franco; Signorini, Ernesto; and Palla, Ottorino, to Montedison S.p.A. Compounds having a antidote activity for the protection of cultivations of agrarian interest from the action of nonselective herbicides. 4,628,101, Cl. 548-200.000.
Cambridge Applied Systems, Inc.: *See*—
Wright, Hubert A., 4,627,272, Cl. 73-57.000.
Cameron, Scott H., to United States of America, Army. Radiation scanning and detection system. 4,627,724, Cl. 356-141.000.
Camm, John J., to Repco Limited. Relay valve. 4,627,668, Cl. 303-40.000.
Campbell, Alan H.: *See*—
Duffy, Thomas E.; Archibald, John P.; and Campbell, Alan H., 4,627,386, Cl. 122-1.00B.
Campbell Soup Company: *See*—
von Lersner, Wolf A., 4,627,475, Cl. 141-107.000.
Campbell, Todd D.; and Nashef, Aws S., to American Hospital Supply Corporation. Method of producing prostheses for replacement of articular cartilage and prostheses so produced. 4,627,853, Cl. 623-16.000.
Campisi, Carl; Lev, Abraham; and Schmid, Richard G., to Zenith Electronics Corporation. Insertion verification and crimping of leads. 4,627,157, Cl. 29-741.000.
Camras, Marvin, to IIT Research Institute. Magnetic recording system and method. 4,628,374, Cl. 360-66.000.
Camus, Gerard, to Automobiles Peugeot; and Automobiles Citroen. Hydraulic assisted steering for motor vehicles. 4,627,510, Cl. 180-148.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Feldman, Kieva; Charest, Robert J.; Verville, Gaston; and Lackner, Joseph L., 4,628,011, Cl. 429-49.000.
Canadian Patents and Development Limited: *See*—
Kusters, Norbert L.; and Herriot, Glen A., 4,628,257, Cl. 324-142.000.
Rioux, Marc, 4,627,734, Cl. 356-376.000.
Candy, Jean-Pierre: *See*—
Bournonville, Jean-Paul; Candy, Jean-Pierre; and Mabilon, Gil, 4,628,130, Cl. 568-885.000.
Canevari, Ronald D., to Allied Corporation. Electrical tilt switch. 4,628,160, Cl. 200-61.45R.
Canon Denshi Kabushiki Kaisha: *See*—
Kato, Masahiro; and Ogawa, Tetsu, 4,628,376, Cl. 360-71.000.
Canon Kabushiki Kaisha: *See*—
Harigaya, Isao, 4,628,377, Cl. 360-72.100.
Kitajima, Tadayuki; Kitahara, Makoto; and Murakami, Koichi, 4,627,709, Cl. 355-14.0SH.
Kobayashi, Masatsune; Eida, Tsuyoshi; Koike, Shoji; and Nakousai, Keiko, 4,627,875, Cl. 106-22.000.
Matsumoto, Haruyuki, 4,628,332, Cl. 346-140.00R.
Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; Toriumi, Mototada; and Nishino, Fumio, 4,627,701, Cl. 355-3.0CH.
Satomura, Hiroshi, 4,628,183, Cl. 219-216.000.
Suematsu, Koshi; Ikeda, Takeshi; Yamamoto, Atsuko; Goto, Koji; and Imai, Eiichi, 4,628,019, Cl. 430-106.600.
Suzuki, Hiroaki; Murata, Shinji; Shirai, Masanari; and Onuki, Kazuhiko, 4,627,703, Cl. 355-3.00R.
Takayama, Makoto, 4,628,271, Cl. 329-50.000.
Takayama, Nobutoshi, 4,628,378, Cl. 360-77.000.
Terasawa, Koji, 4,628,333, Cl. 346-140.00R.
Usami, Akihiro, 4,627,712, Cl. 355-14.00R.
Yonemori, Takaji; and Adachi, Hideki, 4,627,720, Cl. 355-57.000.
Cantile, Jack W., to Hammermill Paper Company. System for in-line processing of envelopes and the like. 4,627,222, Cl. 53-443.000.
Canton, Armando, to Fadis S.p.A. Apparatus for reversing hose. 4,627,557, Cl. 223-39.000.
Capaul, Raymond W. Tackable acoustical structure. 4,627,199, Cl. 52-145.000.
Carabelli, Robert A.; and Edmund, Allan G., to Carabelli, Robert A. Lumbosacral support. 4,627,109, Cl. 2-44.000.
Cardas, George F. Multi-strand conductor cable having its strands sized according to the golden section. 4,628,151, Cl. 174-114.00R.
Carhart, Edward P., Jr.: *See*—
Moran, Robert P.; and Carhart, Edward P., Jr., 4,627,973, Cl. 424-47.000.
Carl Schenck AG: *See*—
Schonfeld, Harald; and Bauer, Angelo, 4,627,747, Cl. 384-113.000.
Carl-Zeiss-Stiftung: *See*—
Kurz, Dieter; and Schafer, Norbert, 4,628,226, Cl. 315-102.000.
Carle & Montanari S.p.A.: *See*—
Ripani, Sergio; and Serafini, Giulio, 4,627,337, Cl. 99-485.000.
Carless, Derek R.: *See*—
French, Timothy O.; Carless, Derek R.; Ault, Reginald A.; and Darlow, Michael B., 4,627,723, Cl. 356-5.000.
Carlson, Gilbert E.: *See*—
Conrad, Erich H.; Conrad, Bernhard; Anderson, Robert L.; and Carlson, Gilbert E., 4,627,369, Cl. 112-103.000.
Carlton, Roger. Radiation filter. 4,628,365, Cl. 358-245.000.
Carr, Neil: *See*—
Eidenschink, Rudolf; Krause, Joachim; Andrews, Beatrice M.; Gray, George W.; and Carr, Neil, 4,627,933, Cl. 252-299.600.
Carranza, Jose R., to Merrick Industries. Flexible detachable handle and carrier for a plastic bottle and the combination thereof. 4,627,546, Cl. 215-100.00A.
Carrier Corporation: *See*—
Mancabelli, Robert C., 4,627,155, Cl. 29-726.000.
Carruthers, Alec R., to ALH Systems Limited. Sealing ducts. 4,627,470, Cl. 138-93.000.
Carson, Matthew; LeMahieu, Ronald A.; and Nason, William C., to Hoffmann-La Roche Inc. Substituted 4-acetyl-3-hydroxyphenoxy alkanoic acids. 4,628,115, Cl. 562-464.000.
Carter, David E.; Bailey, Malcolm J.; and Willatts, Brian A., to Pledge Office Chairs Limited. Tilting mechanism for a chair. 4,627,662, Cl. 297-313.000.
Cartret, Roger; and Volpe, Giovanni, to Thomson CSF Telephone. Multi-level arbitration system for decentrally allocating resource priority among individual processing units. 4,628,447, Cl. 364-200.000.
Caruso, Richard. Electrically heated hair roller. 4,627,452, Cl. 132-33.00R.
Casagrande, Cesare; Ghirardi, Paolo; Goldberg, Leon I.; and Marchetti, Germano, to SIMES, Societa Italiana Medicinali e Sintetici S.p.A. Epinine and the therapeutic use thereof. 4,628,064, Cl. 514-654.000.
Casciari, Raoul: *See*—
Raj, Kuldip; and Casciari, Raoul, 4,628,384, Cl. 360-97.000.
Case, Steven K.: *See*—
Gombrich, Peter P.; Case, Steven K.; and Konicek, Lawrence R., 4,628,313, Cl. 340-870.020.
Casio Computer Co., Ltd.: *See*—
Arai, Kouichi; and Akita, Yukio, 4,627,708, Cl. 355-14.00R.
Kaneko, Youji, 4,627,325, Cl. 84-1.260.
Yajima, Hiroshi, 4,627,511, Cl. 180-167.000.
Casio Electronics Manufacturing Co., Ltd.: *See*—
Arai, Kouichi; and Akita, Yukio, 4,627,708, Cl. 355-14.00R.
Caterpillar Inc.: *See*—
Laylock, Rick A.; and Theobald, Michael R., 4,627,302, Cl. 74-360.000.
Cawston, John F.; and Becker, Paul E., to Shipley Company Inc. Metal ion free photoresist developer composition with lower alkyl quaternary ammonium hydrozide as alkalai agent and a quaternary ammonium compound as surfactant. 4,628,023, Cl. 430-331.000.
Cegedur Societe de Transformation de l'Aluminium Pechiney: *See*—
Colas, Francois, 4,627,149, Cl. 29-516.000.
Celanese Corporation: *See*—
Chen, Paul N., Sr.; and Tucker, Richard O., 4,628,067, Cl. 521-25.000.
Ophir, Zohar, 4,627,952, Cl. 264-328.120.
Smith, Brad L.; Torrence, George P.; and Aguilo, Adolfo, 4,628,041, Cl. 502-24.000.
Cenedella, Richard J. Vinyl bromide extraction of butyric acid and butanol from microbial fermentation broth. 4,628,116, Cl. 562-513.000.
Centre de Recherches Metalurgiques-Centrum Voor Research in de Metallurgie: *See*—
Crahay, Jean R., 4,628,179, Cl. 219-121.0LH.
Centre Electronique Horloger S.A.: *See*—
Vittoz, Eric A.; and Oguey, Henri J., 4,628,274, Cl. 330-9.000.
Centro Studi e Servizi Moda di Paola Bertagnin E C. S.A.S.: *See*—
Scarpa, Afra; and Scarpa, Tobia, 4,627,544, Cl. 211-189.000.
Centronics Data Computer Corp.: *See*—
Costello, Robert E., 4,627,344, Cl. 101-93.140.
Cerberus AG: *See*—
Forster, Martin; and Strassler, Sigfrid, 4,627,269, Cl. 73-23.000.
Cerkanowicz, Anthony E.: *See*—
Ryan, Douglas G.; Cerkanowicz, Anthony E.; Chimenti, Robert J. L.; and Mintz, Donald J., 4,627,901, Cl. 204-190.000.
Chabria, Paul R., to Press-A-Lite Corporation. Multi-purpose miniature flashlight device. 4,628,418, Cl. 362-116.000.
Chabrolle, Jacques, to LCC.CICE-Compagnie Europeenne de Composants Electroniques. Magnetic reading and/or writing head support assembly. 4,628,386, Cl. 360-104.000.
Chadwick, Peter E.; Moon, Philip A. K.; and Thompson, Norman C., to Plessey Overseas Limited. Radio receiver. 4,628,518, Cl. 375-88.000.
Chaffee, Alan L.: *See*—
Johns, Reginald B.; Chaffee, Alan L.; Cain, David A.; and Buchanan, Alan S., 4,627,575, Cl. 241-15.000.
Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., to Advanced Magnetics, Inc. Binding assays employing magnetic particles. 4,628,037, Cl. 436-526.000.
Chalus, Bernard: *See*—
Peronneau, Georges; and Chalus, Bernard, 4,627,642, Cl. 283-92.000.

Chance, Christopher P.; Coble, Ralph P., Jr.; Ingle, Edwin C.; and Jones, Joye A., to AT&T Bell Laboratories. Bidirectional adaptive voice frequency repeater. 4,628,157, Cl. 379-410.000.
Chang, Che-Yuan. Means of comb bristles by overall planting method. 4,627,451, Cl. 132-11.00A.
Chang, In-Kook, to SDS Biotech Corporation. Method for inhibiting axillary bud growth. 4,627,869, Cl. 71-78.000.
Chang, Wei-Chuan; and Yin-Lung, Yang. Method of and apparatus for transporting goods. 4,627,539, Cl. 206-597.000.
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Current, Steven P., 4,628,113, Cl. 560-232.000.
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Field, Leslie A., 4,627,912, Cl. 708-139.000.
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Holmstrom, Roger P.; and Chi, Jim-Yong, 4,627,883, Cl. 148-187.000.
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Brieu, Francois, 4,627,176, Cl. 34-115.000.
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Kaminski, Les K.; and Dyke, Michael E., 4,628,417, Cl. 362-74.000.
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Hattori, Fumihiko; and Shimosato, Yoshikazu, 4,627,814, Cl. 432-128.000.
Chung, Han C.: *See*—
Johnstone, Richard; Kirkham, Edward E.; Chung, Han C.; and Ostby, Lyle D., 4,628,441, Cl. 364-167.000.
Ciba-Geigy Corporation: *See*—
Bernheim, Michael; Meindl, Hubert; Rohringer, Peter; Wegmuller, Hans; and Werthemann, Dieter, 4,627,889, Cl. 162-158.000.
Schmid, Rolf; Zondler, Helmut; Fischer, Michael; and Stauffer, Werner, 4,628,105, Cl. 548-341.000.
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Ricard, Jacques, 4,628,414, Cl. 362-61.000.
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Grone, Robert J.; and Grimshaw, Michael N., 4,627,886, Cl. 156-361.000.
Citizen Watch Co., Ltd.: *See*—
Shingo, Ichikawa; Nakagawa, Hisahide; Kano, Hayao; and Kudo, Koji, 4,627,739, Cl. 368-282.000.
Clarion Co., Ltd.: *See*—
Takai, Kazuki, 4,628,381, Cl. 360-93.000.
Clark, Daren A.: *See*—
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Claussen, Gary J. Heated inking roll for a printer. 4,627,349, Cl. 101-348.000.
Clegg, John E. Louvered conical beam concentrator RT:C. 4,627,692, Cl. 350-432.000.
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Clemens, Philip M. Digital audio disk enclosure. 4,627,532, Cl. 206-309.000.
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LaRue, Albert D.; Clocker, Roger A.; and Smith, Norman F., Jr., 4,627,366, Cl. 110-263.000.
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Clough, Peter S.: *See*—
Parkes, Adrian S.; Corbett, Gordon J.; Clough, Peter S.; and Barker, Colin N. H., 4,627,471, Cl. 138-97.000.
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Butt, Andrew R., 4,627,367, Cl. 110-347.000.
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Coburn, Brian. Ratio speed adaptor. 4,627,310, Cl. 74-763.000.
Coelho, Gregorio J.: *See*—
Karubian, Ralph K.; and Coelho, Gregorio J., 4,627,167, Cl. 30-228.000.
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Serfaty, Salomon; and Cohen, Mordechay, 4,628,474, Cl. 364-825.000.
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McElhaney, William G., 4,627,257, Cl. 72-102.000.
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Coleman, Gary W. Side vision aid for trailer hitching. 4,627,634, Cl. 280-477.000.
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Gaffar, Abdul; and Polefka, Thomas G., 4,627,977, Cl. 424-52.000.
Collagen Corporation: *See*—
Seyedin, Saeid; and Thomas, Thomas, 4,627,982, Cl. 424-95.000.
Collins, Floyd K.; and Say, Donald L., to North American Philips Consumer Electronics Corp. Beam shaping CRT electrode. 4,628,224, Cl. 313-414.000.
Collins, John, to Leer, Incorporated. Pick-up cap construction. 4,627,655, Cl. 296-167.000.
Collins, Larry R., to Venco Manufacturing, Inc. Loading and unloading apparatus for a vehicle. 4,627,784, Cl. 414-540.000.
Colt Industries Operating Corp: *See*—
Dougherty, Michael; and House, William J., 4,627,304, Cl. 74-469.000.
Columbia University in the City of New York, The Trustees of: *See*—
Rose, Eric; and Dresdale, Arthur, 4,627,879, Cl. 106-124.000.
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Chatelin, Roger; Combes, Jean-Francois; and Wattiez, Daniel, 4,627,920, Cl. 210-668.000.
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Nelson, David A., 4,628,279, Cl. 330-257.000.
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Allias, Bernard, 4,628,309, Cl. 340-825.540.
Boulard, Pierre; and Gouriou, Roger, 4,628,502, Cl. 370-84.000.
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Quackenbush, James E., 4,628,380, Cl. 360-78.000.
Conolly, Ralph I., to Rolls-Royce Limited. Method for eliminating, or minimizing the effects of, defects in materials. 4,628,008, Cl. 448-548.000.

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Conrad, Erich H.; Conrad, Bernhard; Anderson, Robert L.; and Carlson, Gilbert E., 4,627,369, Cl. 112-103.000.

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Metzger, Romain, 4,627,383, Cl. 119-1.000.

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Montague, Herbert R., 4,628,438, Cl. 363-134.000.

Cook, Kenneth G., to M-O Valve Company Limited, The. Surge voltage protection arrangements. 4,628,398, Cl. 361-120.000.

Cook, Kenneth P., to Site Microsurgical Systems, Inc. Microsurgical system cassette assembly. 4,627,833, Cl. 604-34.000.

Cooke, Carl W. Child resistant package. 4,627,547, Cl. 215-222.000.

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Ogle, William D., 4,628,423, Cl. 362-341.000.

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Weaver, James A., 4,628,473, Cl. 364-822.000.

CooperVision, Inc.: *See*—
Dewey, David A., 4,628,416, Cl. 362-32.000.

Copal Company Limited: *See*—
Akimoto, Shigeyuki, 4,627,297, Cl. 73-862.340.

Copal Electronics Co., Ltd.: *See*—
Hirose, Masashi, 4,627,303, Cl. 74-425.000.

Corbett, Gordon J.: *See*—
Parkes, Adrian S.; Corbett, Gordon J.; Clough, Peter S.; and Barker, Colin N. H., 4,627,471, Cl. 138-97.000.

Cordis Corporation: *See*—
Cuadra, Emilio; and DelValle, Roberto, 4,627,840, Cl. 604-151.000.
Harris, Donald L., 4,627,439, Cl. 128-419.00P.
Hooven, Michael D.; and Sainte-Rose, Christian, 4,627,832, Cl. 604-9.000.

Corley, Larry S., to Shell Oil Company. Cure rate control in epoxy resin compositions. 4,628,080, Cl. 528-88.000.

Cormier, Alan D.; and Weinberg, Melvin S., to AMDEV, Inc. Means and methods for quantitative determination of analyte in liquids. 4,627,893, Cl. 204-1.00T.

Cornelius Cannon, Inc.: *See*—
Fredrickson, Howard J., 4,627,542, Cl. 211-150.000.

Coste, Christian, to Degremont. Process and apparatus for the recovery of energy from an ozone production unit. 4,627,924, Cl. 210-760.000.

Costello, Robert E., to Centronics Data Computer Corp. Impact printer with magnetic interaction compensation. 4,627,344, Cl. 101-93.140.

Coulter Systems Corporation: *See*—
Kuehnle, Manfred; Cahill, Lysle D.; Butler, John C.; and Bassuk, Lawrence J., 4,628,367, Cl. 358-285.000.

Courteau, Marc A. Bird tree apparatus. 4,627,384, Cl. 119-26.000.

Covey, James H., to Boeing Company, The. Lightning protection of fasteners in composite material. 4,628,402, Cl. 361-218.000.

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Cox, Timothy B., to Rollscreen Company. Window sash breather device. 4,627,206, Cl. 52-302.000.

CPC International Inc.: *See*—
Katkocin, Dennis M.; Zeman, Nancy W.; and Yang, Shiow-Shong, 4,628,028, Cl. 435-95.000.

CRA Services Limited: *See*—
Johns, Reginald B.; Chaffee, Alan L.; Cain, David A.; and Buchanan, Alan S., 4,627,575, Cl. 241-15.000.

Crabtree, Larry V., to Morval-Durofoam Ltd. Method and molding apparatus for molding expanded polystyrene articles having smooth surfaces. 4,627,946, Cl. 264-51.000.

Crahay, Jean R., to Centre de Recherches Metalurgiques-Centrum Voor Research in de Metallurgie. Method of improving the state of the surface of a roll. 4,628,179, Cl. 219-121.0LH.

Cray Research, Inc.: *See*—
August, Melvin C.; and Williams, John T., 4,628,407, Cl. 361-388.000.

Crean, Robert F. Simplified polar mount for satellite tracking antenna. 4,628,323, Cl. 343-765.000.

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Ramsey, Maynard, III; Muskatello, James M.; Hood, Rush W., Jr.; Medero, Richard; and Stephenson, Stanley K., 4,627,440, Cl. 128-682.000.

Crosby, John J.; and Napiorkowski, John J., to GTE Products Corporation. Voltage surge suppressor. 4,628,394, Cl. 361-56.000.

Crosfield Electronics (USA) Limited: *See*—
Aughton, John E.; and Oldershaw, Robert J., 4,628,350, Cl. 358-75.000.

Cross, David E.; Adams, Robert D.; and Floyd, Terence J., to Bard Limited. Stylet actuated winged catheter. 4,627,838, Cl. 604-105.000.

Cross, Robert J.: *See*—
Bird, Kenneth J. H.; Cross, Robert J.; and Singh, Manjit, 4,627,457, Cl. 137-1.000.

Crouse, William G., to International Business Machines Corp. FET switch for high frequency signals. 4,628,307, Cl. 340-825.050.

Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Roba, Giacomo, 4,627,865, Cl. 65-3.120.

Cuadra, Emilio; and DelValle, Roberto, to Cordis Corporation. Flow monitoring device. 4,627,840, Cl. 604-151.000.

Cuba, Gary W.; and Laughlin, Edward N., to Westinghouse Electric Corp. Tube cutter for cutting two concentric tubes bulged together. 4,627,163, Cl. 30-95.000.

Cucchi, Giovanni; and Cucchi, Pietro, to F.LLI Cucchi S.r.l. Device for withdrawing and unloading crop-ends of metal bars from a bar pusher. 4,627,779, Cl. 414-17.000.

Cucchi, Pietro: *See*—
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Current, Steven P., to Chevron Research Company. Alcohol carbonylation process using a bimetallic cobalt catalyst. 4,628,113, Cl. 560-232.000.

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Cushman, Robert H., to AT&T Technologies, Inc. Method for inserting multilead components into printed wiring boards. 4,627,161, Cl. 29-838.000.

Czernik, Roman: *See*—
Norwood, Richard L.; Krasznai, Charles Z.; Czernik, Roman; and Haggstrom, Olle E., 4,628,185, Cl. 219-386.000.

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Dahm, Klaus-Peter. Cosmetic stick with applicator. 4,627,454, Cl. 132-88.700.

Daicel Chemical Industries, Ltd.: *See*—
Okabayashi, Norio; and Onizawa, Yoshio, 4,627,809, Cl. 425-555.000.
Yuki, Yoichi, 4,627,919, Cl. 210-656.000.

Daido Tokushuko Kabushiki Kaisha: *See*—
Okabe, Takahiro; and Mizuno, Masashi, 4,627,743, Cl. 374-122.000.

Daimler-Benz Aktiengesellschaft: *See*—
Geldec, Selcuk, 4,627,525, Cl. 192-84.00C.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Fukumura, Sadaaki; Hashimoto, Takeji; and Tano, Hirofumi, 4,628,326, Cl. 346-29.000.
Yamada, Mitsuhiko, 4,628,366, Cl. 358-280.000.
Yamasaki, Masahiro; Wakabayashi, Masayoshi; Yamada, Jun; and Senga, Takao, 4,627,698, Cl. 354-317.000.

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Debenham, Michael, deceased; Dalli, Alan G.; Revill, Peter L.; Debenham, Barbara S., co-executor; and Debenham, David, co-executor, 4,627,778, Cl. 413-58.000.

Daly, Marshall. Stand-alone keyphone system. 4,628,153, Cl. 379-163.000.

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Stone, David H.; Pintsov, Leon A.; and D'Amato, Donald P., 4,628,532, Cl. 382-21.000.

D'Amato, Michael J., to Harvey Hubbell Incorporated. Housing for electrical connectors. 4,627,684, Cl. 339-206.00R.

Danieli & C. Officine Meccaniche S.p.A.: *See*—
Fuccaro, Giorgio, 4,627,320, Cl. 83-163.000.

Daniels, John A.; and Ziegler, John H., to Autotron Products, Inc. Truck deflector shield. 4,627,657, Cl. 296-91.000.

Danko, Michael, to Emerson Electric Co. Electric resistance heater. 4,628,189, Cl. 219-532.000.

Darlow, Michael B.: *See*—
French, Timothy O.; Carless, Derek R.; Ault, Reginald A.; and Darlow, Michael B., 4,627,723, Cl. 356-5.000.

Davis, Maurice J., to Drillco Devices Limited. Anchor bolt setting impact tool. 4,627,140, Cl. 29-264.000.

Davis, Ray E., Jr.; Foster, Robert G.; Westkamper, Michael J.; Duncan, Dana L.; and Hall, James R., to Chesebrough-Pond's Inc. Video measuring system. 4,628,353, Cl. 358-107.000.

Davis, Roy F.; and Murphy, William. Boat mooring device. 4,627,375, Cl. 114-230.000.

Davis, Walter L.; and Prieto, Yolanda, to Motorola, Inc. Tuned inductorless active phase shift demodulator. 4,628,272, Cl. 329-110.000.

Dean, Barry D., to Atlantic Richfield Company. Polymerization initiator. 4,627,938, Cl. 260-239.0BC.

de Angeli, Michael M. Exercise apparatus. 4,627,614, Cl. 272-117.000.

DeBruyn, William, to Amerock Corporation. Pull-out rack for a cabinet. 4,627,672, Cl. 312-331.000.

Deck, Werner: *See*—
Grams, Timm; Deck, Werner; Figge, Johannes; and Siebert, Hartmut, 4,628,503, Cl. 370-85.000.

De Coene, Frans J. G. C., to New Holland Inc. Crop gathering attachment for crop harvesting machine. 4,627,226, Cl. 56-14.600.

Decowski, Stanley J., Jr.: *See*—
Puletti, Paul P.; and Decowski, Stanley J., Jr., 4,627,847, Cl. 604-366.000.

De Filippi, Quinto. Refuse disposal apparatus and vehicle. 4,627,783, Cl. 414-517.000.

DeFilippis, Stanley J.: *See*—
van Cauter, Gustav C.; Everett, Leroy J.; and DeFilippis, Stanley J., 4,628,205, Cl. 250-361.00R.

Degnan, Thomas F., Jr.: *See*—
Chen, Nai Y.; and Degnan, Thomas F., Jr., 4,627,911, Cl. 208-120.000.

Degremont: *See*—
Coste, Christian, 4,627,924, Cl. 210-760.000.

Degussa Aktiengesellschaft: *See*—
Drauz, Karlheinz; and Kleemann, Axel, 4,628,126, Cl. 568-771.000.

DeHond, Mitchell R.; and Ledak, Paul J., to International Business Machines Corporation. Automatic layout for cascode voltage switch logic. 4,627,152, Cl. 29-571.000.

Deitch, James C.; Kemppainen, Neis E.; Bradley, James D.; and Pfeffer, George B., to ADC Telecommunications, Inc. Electrical connector apparatus. 4,628,159, Cl. 200-51.050.

Dekrone, Stephen A., to Randek Inc. AC transducers, methods and systems. 4,627,292, Cl. 73-728.000.

Dell, Peter W.: *See*—
Sager, John C.; Odam, Kenneth D.; Boyd, Robert T.; and Dell, Peter W., 4,628,508, Cl. 371-9.000.

Delta Kogyo Co., Ltd.: *See*—
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Dempsey, Will R.; Bayless, Ernest O.; and Clark, Samuel D., to B & B Precision Machines, Inc. Arc welding torch. 4,628,177, Cl. 219-121.0PN.

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Berthet, Aristide; and Denier, Guy, 4,627,601, Cl. 266-212.000.

Dennison Manufacturing Company: *See*—
Bone, Arnold R., 4,627,562, Cl. 227-67.000.
Briere, Richard L., 4,628,227, Cl. 315-111.810.
Lynch, Steve J., 4,627,220, Cl. 53-414.000.

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Rodloff, Rudiger K.; and Jungbluth, Werner W., 4,628,515, Cl. 372-107.000.

Deutsche Thomson-Brandt GmbH: *See*—
Geiger, Erich; Otto, Bernhard; and Kaaden, Jurgen, 4,628,345, Cl. 358-13.000.

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Huhman, Michael L., 4,627,446, Cl. 130-27.00Z.

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Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; and Michael, Dietrich, 4,628,069, Cl. 524-339.000.
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,628,079, Cl. 528-49.000.

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Dickens, Caroline B.: *See*—
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Jerde, James B.; and Vasbinder, James E., 4,627,740, Cl. 374-1.000.

Dillenburg, John N., Jr.: *See*—
Magee, William E.; Geister, Michael; and Dillenburg, John N., Jr., 4,627,499, Cl. 173-43.000.

Dines, Keith W., to Dines Plastics Limited. Container with tamper-evident lid. 4,627,550, Cl. 220-306.000.

Dines Plastics Limited: *See*—
Dines, Keith W., 4,627,550, Cl. 220-306.000.

DiPardo, Robert M.: *See*—
Bock, Mark G.; Veber, Daniel F.; and DiPardo, Robert M., 4,628,084, Cl. 540-509.000.

Dismukes, Newton B. Liquid-filled collar for tool string. 4,627,502, Cl. 175-320.000.

Diversey Corporation: *See*—
Bird, Kenneth J. H.; Cross, Robert J.; and Singh, Manjit, 4,627,457, Cl. 137-1.000.

Diversified Products Corporation: *See*—
Rockwell, Gary; and Bartlett, Randall, 4,627,619, Cl. 272-134.000.

Dixon, Raymond E. Right-of-way tree line trimmer. 4,627,227, Cl. 56-235.000.

Dixon, Richard D., to Huck Manufacturing Company. Blind fastener with grip compensating means. 4,627,775, Cl. 411-34.000.

Djuric, Stevan W.: *See*—
Rorig, Kurt J.; Djuric, Stevan W.; Fowler, Kerry W.; and Liang, Chi-Dean, 4,628,095, Cl. 546-234.000.

Dobbins, Bob M.; and Barnes, Elwood E., to Mars, Inc. Method and apparatus for currency validation. 4,628,194, Cl. 235-379.000.

Dr. Ing h.c.F. Porsche AG: *See*—
Tutzer, Peter, 4,627,513, Cl. 180-249.000.

Dr. Johannes Heidenhain GmbH: *See*—
Schmitt, Walter, 4,628,201, Cl. 250-237.00G.

Dohya, Akihiro, to Nippon Electric Co., Ltd. Substrate having a pattern of an alloy of gold and a noble and a base metal with the pattern isolated by oxides of the noble and the base metals. 4,628,149, Cl. 174-68.500.

Doi, Hideaki: *See*—
Okamoto, Keiichi; Nakahata, Kozo; Matsuyama, Yukio; Doi, Hideaki; Aiuchi, Susumu; and Nomoto, Mineo, 4,628,531, Cl. 382-8.000.

Dolomitwerke GmbH: *See*—
Zepter, Karl H.; Opitz, Dieter; Roeder, Alfred; and Chmiel, Max, 4,627,948, Cl. 264-56.000.

Dona, Marinus J. J.: *See*—
Smulders, Hendricus F. G.; Hagen, Johannes L. M.; and Dona, Marinus J. J., 4,628,238, Cl. 318-653.000.

Doring, Gunter: *See*—
Radziwill, Wolfgang; Doring, Gunter; and Steinbusch, Hans, 4,628,231, Cl. 318-138.000.

Dorn, Reimund; Ebner, Heinz; Gundert, Johann; Halder, Ernst; Haspel, Werner; Isert, Ingo; Kuhnemann, Gunter; Lutz, Felix; Seibold, Gerhard; and Wessel, Gerhard, to International Standard Electric Corporation. Device for holding in position a transducer and an optical waveguide. 4,627,687, Cl. 350-96.200.

Dorn, Reimund; and Schneider, Martin, to International Standard Electric Corporation. Multimode laser. 4,628,514, Cl. 372-36.000.

Dorr, Robert T. Infusion needle. 4,627,841, Cl. 604-158.000.

Dorsam, Karl-Heinz, to Odenwalder Kunststoffwerke GmbH. Dirt filter for semifluid thermoplastic media. 4,627,916, Cl. 210-488.000.

Doshi, Mahesh: *See*—
Schuler, Donald; and Doshi, Mahesh, 4,628,471, Cl. 364-578.000.

Double L Manufacturing: *See*—
Johnson, Lynn F., 4,627,541, Cl. 209-668.000.

Dougherty, Michael; and House, William J., to Colt Industries Operating Corp. Linkage anti-rattle device and arrangement. 4,627,304, Cl. 74-469.000.

Douglas Marine s.r.l.: *See*—
Scotti, Marino D., 4,627,762, Cl. 403-369.000.

Douglas, Norman F., to Sparton Corporation. Addressable transducer with improved address signal processing. 4,628,315, Cl. 340-870.260.

Douglas, Otis W., III. Flotation hull and boats made therefrom. 4,627,372, Cl. 114-61.000.

Dow Chemical Company, The: *See*—
Buice, Jack E., 4,627,388, Cl. 122-149.000.
Im, Jang-hi, 4,627,138, Cl. 29-25.350.
Johnston, Howard; and Troxell, Lillian H., 4,628,099, Cl. 546-302.000.

Downie, John W., to General Electric Company. Cancellation of scatter jamming. 4,628,320, Cl. 342-16.000.

Draaisma, Rudolph; and Reichmann, Werner. Rotary vane compressor with inlet and outlet valves in the rotor. 4,627,802, Cl. 418-185.000.

Draftex Industries Limited: *See*—
Niemanns, Gerd, 4,627,145, Cl. 29-450.000.

Drauz, Karlheinz; and Kleemann, Axel, to Degussa Aktiengesellschaft. Process for the production of dihydroxybenzenes. 4,628,126, Cl. 568-771.000.

Dresdale, Arthur: *See*—
Rose, Eric; and Dresdale, Arthur, 4,627,879, Cl. 106-124.000.

Dresser Industries, Inc.: *See*—
Chawla, Manmohan S., 4,627,353, Cl. 102-307.000.
Johnson, Samuel C.; and Elliott, James C., 4,627,625, Cl. 277-27.000.
Minette, Daniel C., 4,628,202, Cl. 250-269.000.
Peppers, James M.; and Shaikh, Farhat A., 4,628,495, Cl. 367-85.000.
Winkelbauer, Howard M.; Wang, Ke-Chin; Walther, Frank H., Jr.; and Stock, Donald F., 4,627,945, Cl. 264-29.500.

Dreuilhe, Jacques P.: *See*—
Puff, Roger M.; and Dreuilhe, Jacques P., 4,627,387, Cl. 122-4.00D.

Drillco Devices Limited: *See*—
Davis, Maurice J., 4,627,140, Cl. 29-264.000.

Dronen, Olav. Method for phasic sequential coupling of three-phase short-circuit generators. 4,628,246, Cl. 322-100.000.

DSM RIM Nylon VOF: *See—*
Gabbert, James D.; Garner, Albert Y.; and Hedrick, Ross M., 4,628,075, Cl. 525-403.000.

Dudding, Sheron L., to International Ferry Freight Limited. Bulk cargo containers. 4,627,549, Cl. 220-1.500.

Dudek, David M., to Pfizer Inc. Calcium-aluminum briquettes. 4,627,961, Cl. 420-564.000.

Dudek, Lesley P.: *See—*
Lin, John W.; and Dudek, Lesley P., 4,628,018, Cl. 430-59.000.

Dudley, Hubert T.: *See—*
Young, Kenneth E.; Frohlich, Robert T.; Dudley, Hubert T.; and Hallock, Robert L., Jr., 4,627,207, Cl. 52-361.000.

Dudney, Morris S. Reticle illuminator. 4,627,171, Cl. 33-241.000.

Duffy, Thomas E.; Archibald, John P.; and Campbell, Alan H., to Solar Turbines, Inc. Steam generators and combined cycle power plants employing the same. 4,627,386, Cl. 122-1.00B.

Duke, Jack W.: *See—*
Rhodes, Ronny Q.; and Duke, Jack W., 4,627,595, Cl. 249-121.000.

Dulbecco, Renato: *See—*
White, Christine A.; Dulbecco, Renato; and Allen, William R., 4,628,032, Cl. 435-240.000.

Dumortier, Robert. Latch for utility access door. 4,627,249, Cl. 70-139.000.

Duncan, Dana L.: *See—*
Davis, Ray E., Jr.; Foster, Robert G.; Westkamper, Michael J.; Duncan, Dana L.; and Hall, James R., 4,628,353, Cl. 358-107.000.

Dunnican, William O., to United States of America, Navy. AGC technique for spectrum analyzers. 4,628,255, Cl. 324-77.00C.

Du Pont de Nemours, E. I., and Company: *See—*
Abbott, Scot D.; and Yau, Wallace W., 4,627,271, Cl. 73-55.000.
Farnham, William B.; and Middleton, William J., 4,628,094, Cl. 546-186.000.
Levitt, George, 4,627,873, Cl. 71-93.000.
Loomis, Gary L., 4,627,993, Cl. 428-36.000.
Werjefelt, Bertil, 4,627,431, Cl. 128-201.250.

Dupre, Eugene J., to Minnesota Mining and Manufacturing Company. Cylindrical brush. 4,627,127, Cl. 15-179.000.

Duracell Inc.: *See—*
Pattison, Timothy A., 4,627,154, Cl. 29-623.100.

Durtschi, William G., to Sundstrand Corporation. Power drive unit and control system therefor. 4,627,329, Cl. 91-506.000.

Duterque, Jean-Paul: *See—*
Sherwood, William G.; Queneau, Paul B.; Duterque, Jean-Paul; and Hodges, Donald R., 4,627,900, Cl. 204-147.000.

Duwel, Edward C., to Pitney Bowes Inc. Completing an incomplete trip in an electronic postage meter. 4,628,476, Cl. 364-900.000.

Dyke, Michael E.: *See—*
Kaminski, Les K.; and Dyke, Michael E., 4,628,417, Cl. 362-74.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Brachert, Heinrich; Girke, Dieter; and Kellner, Gerd, 4,627,352, Cl. 102-290.000.

Dzwinel, Jan, to Instytut Gornictwa Naftowego. Apparatus for direct airborne electromagnetic prospecting of hydrocarbon deposits. 4,628,266, Cl. 324-330.000.

E.D.M. Corporation: *See—*
Yui, Katsufumi, 4,627,342, Cl. 101-25.000.

E.S. Products Co.: *See—*
Young, Kenneth E.; Frohlich, Robert T.; Dudley, Hubert T.; and Hallock, Robert L., Jr., 4,627,207, Cl. 52-361.000.

Eastlack, James K.: *See—*
Ashford, James D.; Harrison, Terry W.; Eastlack, James K.; Blount, Curtis G.; Herring, Gary D.; and Underdown, David R., 4,627,496, Cl. 166-292.000.

Eaton Corporation: *See—*
Frederich, William L., 4,628,460, Cl. 364-480.000.
Light, Gerard M., 4,627,523, Cl. 192-58.00B.
Morgan, Paul W.; and Amlani, Kish, 4,627,296, Cl. 73-862.330.
Wittkower, Andrew, 4,628,209, Cl. 250-492.200.

Ebaa Iron Inc.: *See—*
Bradley, Earl T., 4,627,774, Cl. 411-5.000.

Ebeling, Wolfgang, to Turmag-Turbo-Maschinen-Aktiengesellschaft Nuesse & Graefer. Borer head with planetary gearing. 4,627,501, Cl. 175-319.000.

Ebersberger, Hans, to Siemens Aktiengesellschaft. X-ray tube with a magnetically seated rotary anode. 4,628,522, Cl. 378-132.000.

Ebner, Heinz: *See—*
Dorn, Reimund; Ebner, Heinz; Gundert, Johann; Halder, Ernst; Haspel, Werner; Isert, Ingo; Kuhnemann, Gunter; Lutz, Felix; Seibold, Gerhard; and Wessel, Gerhard, 4,627,687, Cl. 350-96.200.

Eckenhoff, James B.: *See—*
Deters, Joseph C.; Theeuwes, Felix; Mullins, Kevin J.; and Eckenhoff, James B., 4,627,850, Cl. 604-892.000.

Economopoulos, Peter C.: *See—*
Ong, Richard H.; Economopoulos, Peter C.; and Guenthner, Russell W., 4,628,489, Cl. 365-230.000.

Edberg, Heini. Welding system for TIG welding. 4,628,180, Cl. 219-124.010.

Edison Price, Inc.: *See—*
Thigpen, F. Bruce; and Price, Edison A., 4,628,500, Cl. 369-249.000.

Edmund, Allan G.: *See—*
Carabelli, Robert A.; and Edmund, Allan G., 4,627,109, Cl. 2-44.000.

Educational Foundation Daido Gakuen: *See—*
Okabe, Takahiro; and Mizuno, Masashi, 4,627,743, Cl. 374-122.000.

Edwards, D. Craig: *See—*
Barr, A. Brinkley; and Edwards, D. Craig, 4,628,302, Cl. 340-620.000.

Egami, Tsuneyuki: *See—*
Saito, Kimitaka; Iwamoto, Kenzi; Egami, Tsuneyuki; Saito, Tsutomu; and Matuyama, Takesi, 4,627,402, Cl. 123-440.000.
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,627,404, Cl. 123-492.000.

Eguchi, Yasukata, to Janome Sewing Machine Co., Ltd. Sewing machine having a stitch control device. 4,627,371, Cl. 112-451.000.

Ehmig, Gerhard, to Schertler, Siegfried. Sealing mechanism for high vacuum valve. 4,627,599, Cl. 251-334.000.

Ehnert, Richard E. Right angle spindle for machine tools. 4,627,773, Cl. 409-215.000.

Eida, Tsuyoshi: *See—*
Kobayashi, Masatsune; Eida, Tsuyoshi; Koike, Shoji; and Nakousai, Keiko, 4,627,875, Cl. 106-22.000.

Eidem, Brian L.: *See—*
Larsen, Lorin V.; and Eidem, Brian L., 4,627,519, Cl. 188-1.110.

Eidenschink, Rudolf; Krause, Joachim; Andrews, Beatrice M.; Gray, George W.; and Carr, Neil, to Merck Patent Gesellschaft mit beschrankter Haftung; and United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defense in Her Britannic Majesty's Government of the. Liquid crystalline phases containing alkylene-type bridges. 4,627,933, Cl. 252-299.600.

Einstein, Harry. Pusher type auto-plane. 4,627,585, Cl. 244-2.000.

Eising, John P., to A. D. Smith Corporation. Condensate discharge device for combustion apparatus. 4,627,460, Cl. 137-192.000.

Eklund, Jan: *See—*
Ronnhult, John; and Eklund, Jan, 4,627,661, Cl. 297-284.000.

Ekman, Kjell R. Arrangement for a push-in coupling. 4,627,644, Cl. 285-3.000.

Elfert, Bernd; and Scholly, Werner, to Kraftwerk Union Aktiengesellschaft. Special endoscope for visually testing for cracks. 4,628,207, Cl. 250-461.100.

Eli Lilly and Company: *See—*
Samaritoni, Jack G., 4,628,088, Cl. 544-224.000.

Elliott, James C.: *See—*
Johnson, Samuel C.; and Elliott, James C., 4,627,625, Cl. 277-27.000.

Elliott, Robert D.: *See—*
Temple, Carroll G.; Montgomery, John A.; and Elliott, Robert D., 4,628,089, Cl. 544-244.000.

Elscint, Ltd.: *See—*
Fenster, Paul, 4,628,357, Cl. 358-111.000.

Emerson Electric Co.: *See—*
Danko, Michael, 4,628,189, Cl. 219-532.000.

Eminent Technology, Inc.: *See—*
Thigpen, F. Bruce; and Price, Edison A., 4,628,500, Cl. 369-249.000.

Empra Systems Corp.: *See—*
Bradley, James; Evans, George E.; Mackenzie, Donald; and Marcuson, Michael, 4,627,821, Cl. 441-83.000.

Endo, Kazuo: *See—*
Kobayashi, Takeshi; Endo, Kazuo; Nanbu, Nobumasa; and Kawamura, Yoshizi, 4,627,688, Cl. 350-173.000.

Endo, Shuichi; and Tonomura, Kenichi, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Memory device. 4,628,510, Cl. 371-21.000.

Endou, Kunihisa, to Toko, Inc. Encapsulated electronic circuit. 4,628,148, Cl. 174-52.0PE.

Energy Pipelines International Company: *See—*
Ward, Gregg D., 4,627,146, Cl. 29-458.000.

Engdahl, Holger, to Enso-Gutzeit Oy. Causticizing method. 4,627,888, Cl. 162-30.110.

Engelhard Corporation: *See—*
Speronello, Barry K., 4,628,042, Cl. 502-263.000.

English Clays Lovering Pochin & Company, Ltd.: *See—*
Jennings, Barry R.; Trimm, Harold H.; and Webb, Terence W., 4,627,727, Cl. 356-338.000.

Ensinger, James W., to Zenith Electronics Corporation. Luminance clipper with color subcarrier filter to prevent clipping of subcarrier. 4,628,348, Cl. 358-39.000.

Enso-Gutzeit Oy: *See—*
Engdahl, Holger, 4,627,888, Cl. 162-30.110.

Epstein, Melvin H.: *See—*
Chubbuck, John G.; and Epstein, Melvin H., 4,627,443, Cl. 128-748.000.

Equitime, Inc.: *See—*
Nance, Edwin P.; Segan, Marc H.; and Terzian, Berj A., 4,627,737, Cl. 368-239.000.

Ernst Stadelmann Gesellschaft m.b.H.: *See—*
Kirchner, Balthasar; and Schleicher, Siegfried, 4,627,535, Cl. 206-387.000.

Esposito, Christopher, to Four Seasons Solar Products Corp. Structural element especially suitable for solar controlling and the like and particularly utilizable for controlling shading. 4,627,202, Cl. 52-209.000.

Esposito, Christopher, to Four Seasons Solar Products Corp. Structural element especially suitable for solar greenhouses and the like. 4,627,208, Cl. 52-483.000.

Esposito, John J., to United States of America, Navy. Low temperature inflator apparatus. 4,627,822, Cl. 441-92.000.

Esselte Security Systems: *See—*
Akerstrom, Bengt; and Hartmann, Friedrich, 4,627,218, Cl. 53-399.000.
Establissements A. Gregoire & Barilleau: *See—*
Billette de Villemeur, Philippe M.; Pournain, Gerard L.; and Cahu, Louis A., 4,627,679, Cl. 339-21.00R.
Etat Francais: *See—*
Parlant, James B.; Etourneau, Michel; and Bled, Christian C., 4,628,401, Cl. 361-178.000.
Ethicon, Inc.: *See—*
Bedi, James J.; Golden, Donald M.; and McVay, William P., 4,627,437, Cl. 128-334.00C.
Ethyl Corporation: *See—*
Holmes, Silas W.; Burt, Edward A.; and Goins, Dixie E., 4,628,127, Cl. 568-781.000.
Klobucar, W. Dirk, 4,627,967, Cl. 423-300.000.
McKinnie, Bonnie G.; and Mitchell, Olan W., 4,628,124, Cl. 568-726.000.
Eto, Yoshizumi: *See—*
Mita, Seiichi; Izumita, Morishi; Umemoto, Masuo; Eto, Yoshizumi; Rokuda, Morito; and Kanada, Hidehiro, 4,628,297, Cl. 340-347.0DD.
Etourneau, Michel: *See—*
Parlant, James B.; Etourneau, Michel; and Bled, Christian C., 4,628,401, Cl. 361-178.000.
Eue, Ludwig: *See—*
Sasse, Klaus; Eue, Ludwig; Santel, Hans-Joachim; and Schmidt, Robert R., 4,627,871, Cl. 71-92.000.
Schwamborn, Michael; Kuhle, Engelbert; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, 4,627,872, Cl. 71-92.000.
Evans, George E.: *See—*
Bradley, James; Evans, George E.; Mackenzie, Donald; and Marcuson, Michael, 4,627,821, Cl. 441-83.000.
Eveleigh, Douglas E.; Waldron, Clarence R.; and Bartley, Timothy, to Parsons & Whittemore, Inc. Method for the conversion of a cellulosic substrate to glucose using *Microbispora bispora,* strain Rutgers P&W. 4,628,029, Cl. 435-99.000.
Everett, Leroy J.: *See—*
van Cauter, Gustav C.; Everett, Leroy J.; and DeFilippis, Stanley J., 4,628,205, Cl. 250-361.00R.
Everett, Seth L., Jr., to United States of America, Army. Dual optical mechanical position tracker. 4,628,239, Cl. 318-685.000.
Ewald, Rolf V. T., to Integrerad Teknik HB. Display comprising light-emitting diodes and a method and an installation for its manufacture. 4,628,422, Cl. 362-240.000.
Ewing, Paul E.; and Grubb, B. Randall, to SS Indus.; and Kennametal, Inc. Cold-headed and roll-formed pick type cutter body with carbide insert. 4,627,665, Cl. 299-79.000.
Excellon Industries: *See—*
Tymes, LaRoy, 4,628,466, Cl. 364-521.000.
Exxon Production Research Co.: *See—*
Thompson, Arthur H.; Katz, Alan J.; and Krohn, Christine E., 4,628,468, Cl. 364-556.000.
Exxon Research & Engineering Company: *See—*
Chapman, Alan T.; and Hill, David N., 4,627,903, Cl. 204-275.000.
Peiffer, Dennis G.; Lundberg, Robert D.; Sedillo, Lawrence P.; and Newlove, John, 4,627,926, Cl. 252-8.55R.
Ryan, Douglas G.; Cerkanowicz, Anthony E.; Chimenti, Robert J. L.; and Mintz, Donald J., 4,627,901, Cl. 204-190.000.
F.LLI Cucchi S.r.l.: *See—*
Cucchi, Giovanni; and Cucchi, Pietro, 4,627,779, Cl. 414-17.000.
Facet Enterprises, Inc.: *See—*
Mortensen, Harold R., Sr., 4,627,299, Cl. 74-7.00A.
Fadis S.p.A.: *See—*
Canton, Armando, 4,627,557, Cl. 223-39.000.
Fahnler, Friedrich: *See—*
Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; and Michael, Dietrich, 4,628,069, Cl. 524-339.000.
Fairchild Camera & Instr. Corp.: *See—*
Vora, Madhukar B.; and Hingarh, Hemraj K., 4,628,339, Cl. 357-15.000.
Fairford Electronics Limited: *See—*
Bristow, Raymond E.; Fitzpatrick, Michael; and Groom, David C., 4,628,241, Cl. 318-778.000.
Fales, Douglas I., to General Motors Corporation. Fluid level sensor. 4,627,282, Cl. 73-302.000.
Falk, Robert A.; and Phillis, Gary L., to Ball Corporation. Method and apparatus for optically measuring three-dimensional coordinates. 4,627,722, Cl. 356-4.500.
Faller, Dagmar. Maximum-minimum-thermometer. 4,627,741, Cl. 374-104.000.
Faller, Peter; Rittinger, Herbert; and Gertitschke, Detlev, to Josef Uhlmann Maschinenfabrik GmbH & Co. KG. Loading apparatus for a packaging machine for small products. 4,627,225, Cl. 53-510.000.
Fantone, Stephen D., to Polaroid Corporation. Optical system with anamorphic prism. 4,627,690, Cl. 350-421.000.
Fanuc Ltd.: *See—*
Kurakake, Mitsuo; Sakamoto, Keiji; and Kinoshita, Jiro, 4,628,240, Cl. 318-723.000.
Fanuc Ltd: *See—*
Hattori, Seiichi, 4,628,484, Cl. 365-52.000.
Ikeda, Yoshiaki, 4,628,305, Cl. 340-703.000.
Isobe, Shinichi; and Sawada, Kazuo, 4,628,442, Cl. 364-167.000.
Nozawa, Ryoichiro; Kiya, Nobuyuki; and Yoshino, Motoaki, 4,628,444, Cl. 364-188.000.
Farnham, William B.; and Middleton, William J., to Du Pont de Nemours, E. I., and Company. Tris(disubstituted amino)sulfonium perfluoroalkoxides and perfluoroalkylmercaptides and process for their preparation. 4,628,094, Cl. 546-186.000.
Federici, Rose M.: *See—*
Mares, Frank; Tang, Reginald T-H.; Galle, James E.; and Federici, Rose M., 4,628,085, Cl. 540-539.000.
Feinwerktechnik Schliecher & Co., Firma: *See—*
Goldhammer, Albert, 4,627,582, Cl. 241-236.000.
Fejes, Julius, to Flo-Tork, Inc. Rotary actuator having cast piston and arcuate rack bearing. 4,627,331, Cl. 92-129.000.
Feldman, Kieva; Charest, Robert J.; Verville, Gaston; and Lackner, Joseph L., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Rejuvenation of nickel-cadmium aircraft battery electrolyte. 4,628,011, Cl. 429-49.000.
Fellows, Mark W.: *See—*
Bruning, Gert W.; and Fellows, Mark W., 4,628,284, Cl. 331-86.000.
Fensch, Thierry, to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux-Efcis^2 . Binary multiplier using ternary code. 4,628,472, Cl. 364-759.000.
Fenster, Paul, to Elscint, Ltd. Digital fluorographic systems. 4,628,357, Cl. 358-111.000.
Fenton, Paul V., Jr., to Strato Medical Corporation. Tubing assembly for infusion device. 4,627,835, Cl. 604-67.000.
Fernald, Mark R.: *See—*
Waters, James P.; and Fernald, Mark R., 4,627,731, Cl. 356-349.000.
Ferrara-Jordan, Elisa M.: *See—*
Anderson, Donald G.; and Ferrara-Jordan, Elisa M., 4,628,327, Cl. 346-33.0ME.
Ferrofluidics Corporation: *See—*
Raj, Kuldip; and Casciari, Raoul, 4,628,384, Cl. 360-97.000.
Feuerstein, Albert; Thorn, Gernot; and Ranke, Horst, to Leybold Heraeus GmbH. Method and system for a vacuum evaporative deposition process. 4,627,989, Cl. 427-10.000.
Fibus, C. Kenneth, to Steel City Corporation, The. Newspaper delivery tube with newspaper retaining flaps. 4,627,566, Cl. 232-1.00C.
Fick, Gerhardt N., to Sigco Research Inc. Sunflower products and methods for their production. 4,627,192, Cl. 47-58.000.
Field, Almeron J.; Whyte, Daniel G.; and Johnson, Gerald L., to Santa Fe International Corporation. Mobile sea barge and platform. 4,627,767, Cl. 405-196.000.
Field, Leslie A., to Chevron Research Company. Reforming process having a high selectivity and activity for dehydrocyclization, isomerization, and dehydroisomerization. 4,627,912, Cl. 708-139.000.
Fiers, Thomas A.: *See—*
Andrews, Thomas L., Jr.; Fiers, Thomas A.; and Laatt, Richard G., 4,628,379, Cl. 360-77.000.
Figard, Joseph E.; Rohlfing, David C.; and Becker, Ralph S., to Phillips Petroleum Company. Photoelectrochemical cell. 4,628,013, Cl. 429-111.000.
Figge, Dieter: *See—*
Keisers, Laurenz; Artz, Gerd; Figge, Dieter; Philipp, Clemens; and Siemer, Hans, 4,627,481, Cl. 164-440.000.
Figge, Johannes: *See—*
Grams, Timm; Deck, Werner; Figge, Johannes; and Siebert, Hartmut, 4,628,503, Cl. 370-85.000.
Figgie International, Inc.: *See—*
Mitchell, Hal D., 4,627,114, Cl. 2-414.000.
Figler, Alan A.: *See—*
Bergemann, David; Figler, Alan A.; Lamadrid, Rene; Pernic, Stanley; and Selman, John J., 4,628,186, Cl. 219-497.000.
Fine, Louis: *See—*
Kamm, Roger D.; and Fine, Louis, 4,627,448, Cl. 131-187.000.
Finkelstein, Joseph A.; Kaiser, Carl; and Kruse, Lawrence I., to Smith-Klein Beckman Corporation. Dopamine-β-hydroxylase inhibitors. 4,628,059, Cl. 514-384.000.
Finucane, Thomas P.: *See—*
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Firebox Corporation: *See—*
Pratt, Lawrence M., 4,627,854, Cl. 44-40.000.
Firestone Tire & Rubber Company, The: *See—*
Shurman, Louis W.; and Bell, Thomas W., 4,627,479, Cl. 152-541.000.
Fischer, Helmut: *See—*
Keim, Dieter; and Fischer, Helmut, 4,628,225, Cl. 313-631.000.
Fischer, Joachim: *See—*
Badenhop, Charles T.; Bourguignon, Anna-Luise; and Fischer, Joachim, 4,627,992, Cl. 427-244.000.
Fischer, Michael: *See—*
Schmid, Rolf; Zondler, Helmut; Fischer, Michael; and Stauffer, Werner, 4,628,105, Cl. 548-341.000.
Fisher, W. Keith, to Monsanto Company. Soft, rubbery, multiphase matrix material and methods for its production. 4,628,073, Cl. 525-70.000.
Fitzpatrick, Michael: *See—*
Bristow, Raymond E.; Fitzpatrick, Michael; and Groom, David C., 4,628,241, Cl. 318-778.000.
Fitzsimmons, Robert A.: *See—*
Newell, Robert E.; and Fitzsimmons, Robert A., 4,627,432, Cl. 128-203.150.
Fleming, Robert F., III: *See—*
Hwang, James G.; Fleming, Robert F., III; and Hayworth, Robert G., 4,628,312, Cl. 340-825.640.
Flemming, D. Frank E., to United States of America, Air Force. High voltage disconnect/reconnect switching device. 4,628,396, Cl. 361-91.000.

Flemming HVIDT Mobelarkitektfirma A/S: *See*—
Pontoppidan, Eskild, 4,627,600, Cl. 254-124.000.

Flo-Tork, Inc.: *See*—
Fejes, Julius, 4,627,331, Cl. 92-129.000.

Flogvall, Anders G., to U.S. Philips Corporation. Motor arrangement comprising at least three co-planar conical motors. 4,628,220, Cl. 310-114.000.

Flow Technology, Inc.: *See*—
Cohrs, Gary D.; and Francisco, Edward E., Jr., 4,627,267, Cl. 73-3.000.

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Cross, David E.; Adams, Robert D.; and Floyd, Terence J., 4,627,838, Cl. 604-105.000.

Floyd, William M., to United Technologies Automotive, Inc. Arrangement for optimized utilization of I/O pins. 4,628,480, Cl. 364-900.000.

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Focke, Heinz; and Liedtke, Kurt, 4,627,450, Cl. 131-282.000.

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Berenjian, Karim, 4,627,306, Cl. 74-492.000.

Ford, Richard A.: *See*—
Tarlton, Curtis S.; and Ford, Richard A., 4,627,529, Cl. 198-778.000.

Ford-Werke AG: *See*—
Brandner, Burkhard; Schilly, Helmut; Stubs, Albert; and Stojek, Dieter, 4,627,401, Cl. 123-439.000.

Forster, Martin; and Strassler, Sigfrid, to Cerberus AG. Method of, and apparatus for, detecting reducing gases in a gas mixture. 4,627,269, Cl. 73-23.000.

Foster, Robert G.: *See*—
Davis, Ray E., Jr.; Foster, Robert G.; Westkamper, Michael J.; Duncan, Dana L.; and Hall, James R., 4,628,353, Cl. 358-107.000.

Foster, Thomas W., Jr. Sled for a reinforcing cage used in a pier. 4,627,211, Cl. 52-652.000.

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Esposito, Christopher, 4,627,202, Cl. 52-209.000.
Esposito, Christopher, 4,627,208, Cl. 52-483.000.

Fowler, Daniel L.; and Kadwell, Brian J., to Robertshaw Controls Company. Supervised start system for microprocessor based appliance controls. 4,628,439, Cl. 364-138.000.

Fowler, Kerry W.: *See*—
Rorig, Kurt J.; Djuric, Stevan W.; Fowler, Kerry W.; and Liang, Chi-Dean, 4,628,095, Cl. 546-234.000.

Fox, Richard B.: *See*—
Sullivan, James B.; and Fox, Richard B., 4,627,178, Cl. 36-44.000.

Framatome: *See*—
Magnin, Raymond, 4,627,213, Cl. 52-745.000.
Puff, Roger M.; and Dreuilhe, Jacques P., 4,627,387, Cl. 122-4.00D.

Framatome & Cie.: *See*—
Leroy, Jean; and Ruiz, Pierre, 4,627,954, Cl. 376-216.000.
Leroy, Jean; and Ruiz, Pierre, 4,627,955, Cl. 376-216.000.

Francies, Sidney E., III, to Burke Company, The. Hoisting anchor assembly for use in cast concrete panels and method. 4,627,198, Cl. 52-125.500.

Francisco, Edward E., Jr.: *See*—
Cohrs, Gary D.; and Francisco, Edward E., Jr., 4,627,267, Cl. 73-3.000.

Franckowiak, Gerhard: *See*—
Goldmann, Siegfried; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,628,107, Cl. 549-23.000.

Franke, Gunter, to Bayer Aktiengesellschaft. Preparation of dioxazine compounds. 4,628,086, Cl. 544-31.000.

Franke, Walter, to Universal Conveyor Co., Inc. Elevating chain conveyor. 4,627,530, Cl. 198-799.000.

Franklin Electric Co., Inc.: *See*—
Schaefer, Edward J., 4,628,236, Cl. 318-558.000.

Frankovsky, Andrew J.: *See*—
Balderes, Demetrios; Frankovsky, Andrew J.; and Jarvela, Robert A., 4,628,411, Cl. 361-414.000.

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Theurer, Josef; and Hansmann, Johann, 4,627,360, Cl. 104-7.200.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,627,358, Cl. 104-7.200.

Franz Xaver Bayer Isolierglasfabrik: *See*—
Bayer, Franz; and Grosch, Karl, 4,627,263, Cl. 72-298.000.

Frederich, William L., to Eaton Corporation. Microprocessor controlled phase shifter. 4,628,460, Cl. 364-480.000.

Fredette, Maurice C. J.; and Yang, Ching-Shi, to Tenneco Canada Inc. Production of chlorine dioxide. 4,627,969, Cl. 423-478.000.

Fredrickson, Howard J., to Cornelius Cannon, Inc. Display apparatus having a mechanism for tilting shelves. 4,627,542, Cl. 211-150.000.

Frei, Roland; and Gutmann, Franz, to Plaston AG. Air cleaning apparatus. 4,627,862, Cl. 55-316.000.

Fremy, Raoul. Coupling device with eccentrically-mounted rotary valve element. 4,627,598, Cl. 251-149.200.

French, Robert C.: *See*—
Nebergall, Perry A.; and French, Robert C., 4,628,168, Cl. 219-10.810.

French, Timothy O.; Carless, Derek R.; Ault, Reginald A.; and Darlow, Michael B., to Barr & Stroud. Optical range simulator devices. 4,627,723, Cl. 356-5.000.

Friel, Daniel D. Method and apparatus for knife and blade sharpening. 4,627,194, Cl. 51-58.000.

Fries, Walter F., to Heinrich Mack Nachf. Stabilized injectable solutions of piroxicam. 4,628,053, Cl. 514-222.000.

Fries, Werner; and Klemm, Karl-Wilhelm, to BASF Farben & Fasern AG. Printing ink. 4,627,876, Cl. 106-27.000.

Frito-Lay, Inc.: *See*—
Plaskett, John, 4,627,217, Cl. 53-374.000.

FRL, Inc.: *See*—
Johnson, David E.; and Williams, Richard W., 4,628,265, Cl. 324-329.000.

Frohlich, Robert T.: *See*—
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Fruchtmann, Romanis: *See*—
Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, 4,628,062, Cl. 514-569.000.

Fu Tai Umbrella Works Ltd.: *See*—
Okuda, Toshio; and Wu, Tsun-Zong, 4,627,455, Cl. 135-25.00A.

Fuccaro, Giorgio, to Danieli & C. Officine Meccaniche S.p.A. Compact shearing machine the scrap shears. 4,627,320, Cl. 83-163.000.

Fuji Electric Co., Ltd.: *See*—
Hongo, Yasuo; and Nitta, Yoshio, 4,628,533, Cl. 382-27.000.
Seki, Yasukazu; Sato, Noritada; and Ishiwata, Osamu, 4,627,991, Cl. 427-39.000.

Fuji Electric Corporate Research & Development Co., Ltd.: *See*—
Seki, Yasukazu; Sato, Noritada; and Ishiwata, Osamu, 4,627,991, Cl. 427-39.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Sakai, Yasuhito, 4,627,313, Cl. 74-867.000.
Takagaki, Katsumi; Ito, Yukinori; and Sumi, Kiyohide, 4,627,521, Cl. 192-2.000.

Fuji Photo Film Co., Ltd.: *See*—
Arakawa, Satoshi, 4,628,208, Cl. 250-483.100.
Igarashi, Akira; Ikeda, Kenji; and Ikeda, Kensuke, 4,628,335, Cl. 346-208.000.
Kobayashi, Hidetoshi; Mihayashi, Keiji; and Itoh, Isamu, 4,628,024, Cl. 430-376.000.
Komiyama, Choji; and Suzuki, Osamu, 4,627,534, Cl. 206-387.000.
Sawada, Satoru; and Nishiyama, Shingo, 4,628,021, Cl. 430-203.000.

Fuji Xerox Co., Ltd.: *See*—
Kurata, Masami; Yamamoto, Tadashi; and Ishikawa, Noriyoshi, 4,628,368, Cl. 358-293.000.
Takahashi, Yuichi; Tasaki, Akira; Itami, Teruhiko; and Tomiyama, Shunsuke, 4,628,328, Cl. 346-74.400.

Fujie, Masakatsu: *See*—
Kamejima, Kohji; Hosoda, Yuji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; Honma, Kazuo; and Yoshida, Takashi, 4,628,453, Cl. 364-424.000.

Fujieda, Mamoru; and Oyama, Yoshishige, to Hitachi, Ltd. Automatic transmission. 4,627,312, Cl. 74-866.000.

Fujihisa, Hiroaki; Ohishi, Hirotoshi; Fujii, Hiroshi; and Kobayashi, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Circuit interrupter. 4,628,288, Cl. 335-166.000.

Fujii, Hiroshi: *See*—
Fujihisa, Hiroaki; Ohishi, Hirotoshi; Fujii, Hiroshi; and Kobayashi, Yoshiaki, 4,628,288, Cl. 335-166.000.

Fujii, Senzo: *See*—
Ogura, Ichiro; Suzuki, Motomu; Fujii, Senzo; and Honda, Michitaka, 4,628,355, Cl. 358-111.000.

Fujii, Takayoshi: *See*—
Maeda, Yuji; Yamato, Hideyuki; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,628,050, Cl. 514-167.000.

Fujikawa, Nobuyoshi: *See*—
Yokoe, Nobuo; Okawa, Takashi; Fujikawa, Nobuyoshi; and Yamashita, Kazuyoshi, 4,628,404, Cl. 361-321.000.

Fujimoto, Nobuaki: *See*—
Yagi, Masaru; Fujimoto, Nobuaki; and Hayashi, Yoshitoki, 4,627,760, Cl. 403-201.000.

Fujimura, Fumio: *See*—
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,628,336, Cl. 346-209.000.

Fujita, Tsutomu: *See*—
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Fujitsu Limited: *See*—
Nakayama, Yoshiro; and Suzuki, Hidetake, 4,628,338, Cl. 357-15.000.
Ono, Izumi; Manago, Iwami; Takayama, Haruo; and Takahashi, Yasuo, 4,627,677, Cl. 339-17.00M.

Fukuda, Shinichi; Kajiyama, Masaki; and Ikemoto, Takeshi, to Nippon Steel Corporation. Method for the ultrasonic flaw detection of an electric welded pipe. 4,627,289, Cl. 73-622.000.

Fukumura, Sadaaki; Hashimoto, Takeji; and Tano, Hirofumi, to Iwatsu Electric Co., Ltd.; and Dainippon Screen Mfg. Co., Ltd. Apparatus for preventing drying-up of drawing needle pens. 4,628,326, Cl. 346-29.000.

Fukuoka, Norio, to Olympus Optical Co., Ltd. Apparatus for copying magnetic tape. 4,628,370, Cl. 360-15.000.

Funabashi, Yoshiyuki: *See*—
Komaita, Toshiki; Nakadate, Takanori; Funabashi, Yoshiyuki; and Kiyohara, Kazuto, 4,628,025, Cl. 430-533.000.

Furuichi, Shinji, to Hitachi Metals, Inc. Read/write and trim erase magnetic head assembly. 4,628,387, Cl. 360-121.000.

Furukawa, Toshihiko, to Sodick Co., Ltd. EDM using two separate dielectric fluids and a system for maintaining segregation of the fluids. 4,628,170, Cl. 219-69.00D.

Furuta, Youichi; and Ochiai, Chiaki, to Aisin Seiki Kabushiki Kaisha. Sealing members for master cylinders. 4,627,332, Cl. 92-168.000.

G. D. Searle & Co.: *See—*
Dickens, Jonathan P.; and McKay, William R., 4,628,104, Cl. 548-341.000.
Rorig, Kurt J.; Djuric, Stevan W.; Fowler, Kerry W.; and Liang, Chi-Dean, 4,628,095, Cl. 546-234.000.

G.D. Societa per Azioni: *See—*
Mattei, Riccardo; and Neri, Armando, 4,627,319, Cl. 83-73.000.

G&H Technology, Inc.: *See—*
Balyasny, Marik; Baldwin, Kenneth B.; and Lovell, William E., 4,627,561, Cl. 225-96.000.

Gabbert, James D.; Garner, Albert Y.; and Hedrick, Ross M., to DSM RIM Nylon VOF. Acid halide functional materials. 4,628,075, Cl. 525-403.000.

Gaffar, Abdul; and Polefka, Thomas G., to Colgate-Palmolive Company. Anticalculus oral composition. 4,627,977, Cl. 424-52.000.

Gagen, Paul F.; Kuhl, Jane F.; Mettler, Stephen C.; and Taylor, Carl R., to AT&T Bell Laboratories. Method and apparatus for recoating spliced end portions of optical fibers. 4,627,942, Cl. 264-1.500.

Galle, James E.: *See—*
Mares, Frank; Tang, Reginald T-H.; Galle, James E.; and Federici, Rose M., 4,628,085, Cl. 540-539.000.

Gamble, John E. Attachment for a standard power planer table. 4,627,478, Cl. 144-287.000.

Garay, Oscar M.: *See—*
Marko, Paul D.; Kneisel, Thomas F.; and Garay, Oscar M., 4,628,322, Cl. 343-702.000.

Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; Linde, David E.; and Hudson, Bertram J., to Garid, Inc. Glucose medical monitoring system. 4,627,445, Cl. 128-770.000.

Gardell, Dietlind; and Rock, Gail. Method and apparatus for automated double fluorochromization analysis in lymphocytotoxicity testing. 4,628,026, Cl. 435-7.000.

Gareis, Ronald E.; and Kocher, Mark J., to General Electric Co. Protected input/output circuitry for a programmable controller. 4,628,397, Cl. 361-98.000.

Garg, Diwakar; Givens, Edwin N.; and Schweighardt, Frank K., to Air Products and Chemicals, Inc. Catalytic coal liquefaction with treated solvent and SRC recycle. 4,627,913, Cl. 208-415.000.

Garid, Inc.: *See—*
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; Linde, David E.; and Hudson, Bertram J., 4,627,445, Cl. 128-770.000.

Garner, Albert Y.: *See—*
Gabbert, James D.; Garner, Albert Y.; and Hedrick, Ross M., 4,628,075, Cl. 525-403.000.

Garner, Andrew; and Singbeil, Douglas L., to Pulp and Paper Research Institute of Canada. Monitor assembly for monitoring anodic corrosion protection of carbon steel vessels. 4,627,905, Cl. 204-404.000.

Garrett Corporation, The: *See—*
O'Hagan, Michael A.; and Smith, Richard D., 4,627,173, Cl. 34-10.000.

Garrison, Linn: *See—*
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; Morrison, Barry L.; Parkinson, Ricky; Garrison, Linn; and Pace, John D., 4,627,787, Cl. 414-786.000.

Gaudiana, Russell A.: *See—*
Rogers, Howard G.; Gaudiana, Russell A.; and Minns, Richard A., 4,628,125, Cl. 568-730.000.

Gause, James E.; and Armiger, Ronald E., to Westinghouse Electric Corp. Joint release mechanism. 4,627,355, Cl. 102-378.000.

Gauss, Walter: *See—*
Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, 4,628,062, Cl. 514-569.000.

Gay, Steffen, to Molecular Engineering Associates, Ltd.; and Universtiy of Alabama, The Board of Trustees of the. Vitro diagnostic methods using monoclonal antibodies against connective tissue proteins. 4,628,027, Cl. 435-7.000.

Gayer, Herbert; Kramer, Wolfgang; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, to Bayer Aktiengesellschaft. Fungicidal tetrahydrothiopyran-3,5-dione derivatives, intermediate derivatives, compositions, and method of use therefor. 4,628,060, Cl. 514-432.000.

Geffcken, Walter; Littwin, Burkhard; and Wengert, Rolf, to Siemens Aktiengesellschaft. Gas discharge display device. 4,628,228, Cl. 315-169.400.

Gehlbach, Roger D. Overhead climber. 4,627,612, Cl. 272-113.000.

Gehman, Roland P.; and Martin, Raymond G., to MGS, Inc. Trailer hitch uncouple detecting and signaling apparatus. 4,627,633, Cl. 280-432.000.

Geiger, Erich; Otto, Bernhard; and Kaaden, Jurgen, to Deutsche Thomson-Brandt GmbH. Circuit for analog digital conversion of a color television signal employing variable signal amplification. 4,628,345, Cl. 358-13.000.

Geister, Michael: *See—*
Magee, William E.; Geister, Michael; and Dillenburg, John N., Jr., 4,627,499, Cl. 173-43.000.

Geldec, Selcuk, to Daimler-Benz Aktiengesellschaft. Electromagnetic clutch for a drive assembly of a motor vehicle. 4,627,525, Cl. 192-84.00C.

Geluk, Ronald J.: *See—*
Mook, Adrianus; and Geluk, Ronald J., 4,628,360, Cl. 358-139.000.

General Electric: *See—*
Wilson, Arthur C., 4,627,246, Cl. 62-286.000.

General Electric Company: *See—*
Anthony, Thomas R., 4,628,174, Cl. 219-76.130.
Boutni, Omar M., 4,628,074, Cl. 525-146.000.
Brooks, Robert B., 4,627,556, Cl. 222-240.000.
Downie, John W., 4,628,320, Cl. 342-16.000.
Gareis, Ronald E.; and Kocher, Mark J., 4,628,397, Cl. 361-98.000.
Hill, William D.; and Akers, David D., 4,628,277, Cl. 330-110.000.
Hodgman, John S.; and Mullersman, Ferdinand H., 4,628,243, Cl. 320-2.000.
Komanduri, Ranga; and Reed, William R., Jr., 4,627,317, Cl. 82-1.00C.
Lee, Ching-Pang, 4,627,480, Cl. 164-369.000.
Mark, Victor, deceased; and Peters, Edward N., 4,628,081, Cl. 528-176.000.
Niedrach, Leonard W.; and Will, Fritz G., 4,627,907, Cl. 204-415.000.
Rickard, Jimmy R.; and Hollenbeck, Robert K., 4,628,443, Cl. 364-184.000.
Roberts, Gerald E.; and Toliver, Samuel, 4,627,379, Cl. 118-721.000.
Scholefield, Clifford L., 4,628,242, Cl. 320-2.000.
Steigerwald, Robert L., 4,628,426, Cl. 363-17.000.
Terhune, James H.; and Gordon, Gerald M., 4,628,252, Cl. 324-65.0CR.

General Electric Company, p.l.c., The: *See—*
Walker, John D., 4,628,428, Cl. 363-21.000.
Walker, John D., 4,628,429, Cl. 363-21.000.

General Foods Corporation: *See—*
Bardsley, Robert F.; Finucane, Thomas P.; Hebel, Carl; Schoonmaker, Charles D.; and Wruk, Philip J., 4,627,986, Cl. 426-112.000.
Barnett, Ronald E.; and Yarger, Ronald G., 4,627,987, Cl. 426-548.000.

General Instrument Corporation: *See—*
Robbins, Clyde N., 4,628,358, Cl. 358-121.000.

General Motors Corporation: *See—*
Derringer, John G., 4,627,391, Cl. 123-90.160.
Fales, Douglas I., 4,627,282, Cl. 73-302.000.
Micheli, Adolph L., 4,627,966, Cl. 423-263.000.
Ulrich, Paul L.; Richards, James; and Tanke, Eugene T., II, 4,627,522, Cl. 192-35.000.

General Signal Corporation: *See—*
Buyak, William P., 4,628,213, Cl. 307-80.000.

Georg Fischer AG: *See—*
Mahnig, Fritz; and Schulte, Gunter, 4,627,667, Cl. 301-126.000.

Georgia Tech. Research Institute: *See—*
Sturrock, Peter E.; and O'Brien, Gerald E., 4,628,463, Cl. 364-497.000.

Gerken, Heiner: *See—*
Kittel, Arthur; and Gerken, Heiner, 4,627,750, Cl. 400-144.200.

Germer, Horst, to Blaupunkt-Werke GmbH. Method and system for matching the sound output of a loudspeaker to the ambient noise level. 4,628,526, Cl. 381-57.000.

Gersh, Michael E.; Bien, Fritz; and Bernstein, Lawrence S., to Spectral Sciences, Inc. Ultraviolet absorption hygrometer. 4,627,284, Cl. 73-336.500.

Gerson, Ira A.: *See—*
Borth, David E.; Gerson, Ira A.; and Vilmur, Richard J., 4,628,529, Cl. 381-94.000.

Gertitschke, Detlev: *See—*
Faller, Peter; Rittinger, Herbert; and Gertitschke, Detlev, 4,627,225, Cl. 53-510.000.

Gesellschaft zur Forderung der Industrieorientierten Forschung an den Schweizerischen Hochschulen und Weiteren Institutionen: *See—*
Stratton, Richard W.; Nicolet, Michel; and Andrews, Glenn, 4,627,957, Cl. 376-412.000.

Ghandehari, Mohammad H., to Union Oil Company of California. Electrolytic production of praseodymium. 4,627,898, Cl. 204-64.00R.

Ghirardi, Paolo: *See—*
Casagrande, Cesare; Ghirardi, Paolo; Goldberg, Leon I.; and Marchetti, Germano, 4,628,064, Cl. 514-654.000.

Gibbard, Henry F., to Gould Inc. Method of generating electrical and magnetic fields in salt water marine environments. 4,627,891, Cl. 204-1.00R.

Gibson, Duane M., to Omark Industries, Inc. Hand held cutting tools. 4,627,165, Cl. 30-166.00R.

Gibson, Geruldine: *See—*
Gibson, James O.; and Gibson, Mark G., 4,627,418, Cl. 126-438.000.

Gibson, James O.; and Gibson, Mark G., to Gibson, Geruldine, a part interest. Apparatus for the carbothermic reduction of metal oxides using solar energy. 4,627,418, Cl. 126-438.000.

Gibson, Mark G.: *See—*
Gibson, James O.; and Gibson, Mark G., 4,627,418, Cl. 126-438.000.

Gill Studios, Inc.: *See—*
Harms, Jeffrey W., 4,627,608, Cl. 271-197.000.

Gilley and Associates: *See—*
Viator, Carrol L.; Gilley, Glenn E.; Broussard, Paul C., Sr.; Broussard, Curtis; and Gracy, Dennis, 4,627,922, Cl. 210-704.000.

Gilley, Glenn E.: *See—*
Viator, Carrol L.; Gilley, Glenn E.; Broussard, Paul C., Sr.; Broussard, Curtis; and Gracy, Dennis, 4,627,922, Cl. 210-704.000.

Gilman, Paul S.; and Mattson, Walter E., to Inco Alloys International, Inc. Production of mechanically alloyed powder. 4,627,959, Cl. 419-61.000.

Gilmore, Douglas D.; and Harz, G. Michael, to Gilmore, Douglas D. Exercise device with opponent supplied resistance. 4,627,617, Cl. 272-120.000.

Ginnow-Merkert, Hartmut: *See—*
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; Linde, David E.; and Hudson, Bertram J., 4,627,445, Cl. 128-770.000.

Gioffre, Anthony J.; and Ross, Ronald J., to Union Carbide Corporation. Effervescent dentifrice. 4,627,972, Cl. 424-44.000.

Giorgi, Ettore, to S.A.E.S. Getters S.p.A. Image intensifier with an electrophoretic getter device. 4,628,198, Cl. 250-213.0VT.

Girke, Dieter: *See—*
Brachert, Heinrich; Girke, Dieter; and Kellner, Gerd, 4,627,352, Cl. 102-290.000.

Givens, Edwin N.: *See—*
Garg, Diwakar; Givens, Edwin N.; and Schweighardt, Frank K., 4,627,913, Cl. 208-415.000.

GKN Automotive Components Inc.: *See—*
Juziuk, Peter M.; and Hazebrook, Daniel W., 4,627,826, Cl. 464-171.000.

Glass, Emmett F.; and Wagstaff, Robert A., to New Holland Inc. Twine wrapping apparatus with trip mechanism actuated twine dispensing member. 4,627,340, Cl. 100-5.000.

Glaxo Group Limited: *See—*
Newell, Robert E.; and Fitzsimmons, Robert A., 4,627,432, Cl. 128-203.150.

Glenn, William E., to New York Institute of Technoloy. Method and apparatus for encoding and decoding video. 4,628,344, Cl. 358-12.000.

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Gokimoto, Hiroyuki; and Kiyomitsu, Isao, to Mazda Motor Corporation; and Delta Kogyo Co., Ltd. Seat for automobile. 4,627,656, Cl. 296-65.00R.

Gold, Calman, to New England Digital Corporation. Pitch extractor apparatus and the like. 4,627,323, Cl. 84-1.010.

Goldberg, Leon I.: *See—*
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Golden, Donald M.: *See—*
Bedi, James J.; Golden, Donald M.; and McVay, William P., 4,627,437, Cl. 128-334.00C.

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Labeda, David P.; Goodman, Joseph J.; and Martin, John H. E. J., deceased, 4,628,046, Cl. 514-33.000.

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Gottling, Helmut: *See—*
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Gibbard, Henry F., 4,627,891, Cl. 204-1.00R.

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Gould, Peter J.; and Turits, Philip D., 4,627,936, Cl. 252-558.000.

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Gozzo, Franco: *See—*
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Brown, Alfred R.; and Whetton, Richard A., 4,628,301, Cl. 340-584.000.

Gray, George W.: *See—*
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Gray Tool Company: *See—*
Hays, Charles, 4,627,958, Cl. 419-8.000.

Green, Gary J.; and Schwartz, Albert B., to Mobil Oil Corporation. Method of making uniform spheroidal catalyst beads. 4,628,040, Cl. 502-9.000.

Greenleaf, Allen H., to United States of America, Air Force. Computer controller optical surfacing (CCOS) lap pressure control system. 4,627,195, Cl. 51-119.000.

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Griesen, Bertus, to Hazemeijer B.V. Method for switching in a three-phase high voltage circuit. 4,628,393, Cl. 361-3.000.

Grilliot, Mary I.: *See—*
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Grilliot, William L.; and Grilliot, Mary I. Firefighter's coat. 4,627,112, Cl. 2-81.000.

Grimbly, Robert H. Safety locking device for doors. 4,627,651, Cl. 292-288.000.

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Grisel, Charles H.; and Hus, Henri, to Hispano-Suiza. Hydro-dynamic fluid bearing comprising bearing members subject to progressive pre-loading. 4,627,746, Cl. 384-99.000.

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Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., 4,628,037, Cl. 436-526.000.

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Gross, Thomas A. O.; Barrett, Raymond L., Jr.; and Pfister, Henry F., to Sensormatic Electronics Corporation. Coil assembly for substantially isotropic flux linkage in a given plane. 4,628,324, Cl. 343-788.000.

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Gruns, James H. Paint brush. 4,627,125, Cl. 15-105.000.
Grunwald, Werner: *See*—
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GTE Communication Systems Corp.: *See*—
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GTE Laboratories Incorporated: *See*—
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GTE Products Corporation: *See*—
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Guerini, John L.: *See*—
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McArthur, David T., deceased, 4,628,420, Cl. 362-208.000.
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Hahn, Gary S., to Immunetech Pharmaceuticals. Immunotherapeutic antiallergic polypeptide agents which bind to basophil immunoglobin Fc receptors. 4,628,045, Cl. 514-17.000.
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Hamamoto, Hideki; Fujita, Tsutomu; and Mori, Takuzo, to Nihon Spindle Seizo Kabushiki Kaisha; and Showa Rekisei Kogyo Kabushiki Kaisha. Method and an apparatus for packing a semisolid compound in bags. 4,627,224, Cl. 53-502.000.
Hamasaki, Hideaki; Maehara, Shigeharu; and Saita, Shinsuke, to Sharp Kabushiki Kaisha. Light amount limiting device of electrophotographic copying machine. 4,627,704, Cl. 355-3.00R.
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Hammett, Geoffrey G., to Scientific-Atlanta, Inc. Linear servoactuator with integrated transformer position sensor. 4,628,499, Cl. 364-167.000.
Hamsher, Wilbur A., Jr.; and Pass, Raymond V., to AMP Incorporated. Tri-lead connector. 4,627,674, Cl. 339-14.00P.
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Gabbert, James D.; Garner, Albert Y.; and Hedrick, Ross M., 4,628,075, Cl. 525-403.000.
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Fries, Walter F., 4,628,053, Cl. 514-222.000.
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Higa, Jack. Dental bridge remover. 4,627,817, Cl. 433-152.000.
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Chapman, Alan T.; and Hill, David N., 4,627,903, Cl. 204-275.000.
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Mita, Seiichi; Izumita, Morishi; Umemoto, Masuo; Eto, Yoshizumi; Rokuda, Morito; and Kanada, Hidehiro, 4,628,297, Cl. 340-347.0DD.
Hitachi Koki Company, Limited: *See—*
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Endo, Shuichi; and Tonomura, Kenichi, 4,628,510, Cl. 371-21.000.
Fujieda, Mamoru; and Oyama, Yoshishige, 4,627,312, Cl. 74-866.000.
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Hitchins, William G. Building foundations invention. 4,627,205, Cl. 52-294.000.
Ho, Eugene Y., to Techne Electronics Ltd. Electronic keyed lock. 4,628,400, Cl. 361-172.000.
Hobrough, Gilbert L. Binocular artificial vision system with variable eyebase in response to a quality of correlation signal. 4,628,210, Cl. 250-558.000.
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Scharf, Udo; Schlingmann, Merten; and von Rymon Lipinski, Gert-Wolfhard, 4,627,983, Cl. 426-7.000.
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Hofer, Gottfried, to Heidelberger Druckmaschinen AG. Sheet delivery device, especially for small offset printing machine. 4,627,609, Cl. 271-311.000.
Hofferber, James A., to Phillips Petroleum Company. Control of a polymerization reaction. 4,628,034, Cl. 436-55.000.
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Hoffner, Charles W., II, to AT&T Bell Laboratories. Multichannel interface. 4,628,446, Cl. 364-200.000.
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Holiman, William E.; and O'Keefe, Henry, to Tire-Gator, Inc. Anti-foul device for tire carcass cutting and shredding apparatus. 4,627,581, Cl. 241-167.000.
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Holstedt, Richard A.; Baron, Kenneth; and Jessup, Peter J., to Union Oil Company of California. Boron-containing heterocyclic compounds and lubricating oil containing same. 4,627,930, Cl. 252-49.600.
Holt, Richard C., to Augat Incorporated. Method of producing a wired circuit board. 4,627,162, Cl. 29-847.000.
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Honeywell Information Systems Inc.: *See—*
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Ong, Richard H.; Economopoulos, Peter C.; and Guenthner, Russell W., 4,628,489, Cl. 365-230.000.
Hong, Douglas. Locking electrical connector. 4,627,681, Cl. 339-75.00P.
Hongo, Yasuo; and Nitta, Yoshio, to Fuji Electric Co., Ltd. Pattern recognition apparatus. 4,628,533, Cl. 382-27.000.
Honma, Kazuo: *See—*
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Hooven, Michael D.; and Sainte-Rose, Christian, to Cordis Corporation. Three stage intracranial pressure relief valve having single-piece valve stem. 4,627,832, Cl. 604-9.000.
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Hori, Katsuyoshi; Watanabe, Eiji; Myoga, Toshiharu; Takuwa, Toshiaki; and Kusano, Kazuki, to Babcock-Hitachi Kabushiki Kaisha. Hot-wire TIG welding apparatus. 4,628,182, Cl. 219-130.510.
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Hruden, Wayne R., to Ultimate Survivor of America Inc. Deferred-action battery. 4,628,014, Cl. 429-113.000.
Hsu, Tracy C., to SCM Corporation. Process for prefinished exterior hardboard. 4,627,999, Cl. 428-326.000.
Huber, Michael S., to United States of America, Navy. Hybrid unitized shock and vibration mitigation system. 4,627,327, Cl. 89-1.816.
Huber, William B., to Nuvatec, Inc. Latching relay. 4,628,289, Cl. 335-168.000.
Hubner, Wolfgang: *See—*
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Huemer, Franz X. Winding equipment. 4,627,583, Cl. 242-45.000.
Huggins, Orville C., to Monarch Marking Systems, Inc. Printing apparatus. 4,627,347, Cl. 101-292.000.
Huggins, Orville C., to Monarch Marking Systems, Inc. Printing apparatus. 4,627,348, Cl. 101-292.000.
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Pollard, Gary B., 4,627,533, Cl. 206-328.000.
Hughes, Raymond J. Apparatus for making capsule having plural chambers. 4,627,808, Cl. 425-270.000.
Huhman, Michael L., to Deutz-Allis Corporation. Downwardly and rearwardly directed air stream for harvester with vertically offset accelerator rolls. 4,627,446, Cl. 130-27.00Z.
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Hunninghaus, Roy; and Almquist, Edward Q., to Motorola, Inc. Pulse detector for missing or extra pulses. 4,628,269, Cl. 328-120.000.
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Hutson, Allan I., to Sundstrand Corporation. Hydrostatic transmission with fixed fluid capacity ratio between pump and motor. 4,627,237, Cl. 60-487.000.
Hutter, Hans-Georg. Chain link runner assembly. 4,627,630, Cl. 280-28.500.
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Hyuga, Kounosuke; Nakamura, Koutaro; and Ogawa, Shouzou, to Japan Tobacco Inc. Flow control system in shredding machine. 4,627,577, Cl. 241-30.000.
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Ibaraki, Yoshiro; Kawabata, Toshiaki; Kan, Tsuneo; and Kishi, Atsuo, to Hitachi, Ltd. Oil separator. 4,627,861, Cl. 55-278.000.
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Nelson, Richard V.; and Stephen, John F., 4,628,096, Cl. 546-250.000.
Ide, Toshiaki: *See—*
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,628,009, Cl. 428-694.000.
Ide, Youji, to Ricoh Co., Ltd. Thermal transfer recording medium. 4,627,997, Cl. 428-216.000.
Idemitsu Kosan Company Limited: *See—*
Takematsu, Tetsuo; Kikkawa, Nobuyuki; and Ogawa, Hideaki, 4,627,874, Cl. 71-118.000.
Igarashi, Akira; Ikeda, Kenji; and Ikeda, Kensuke, to Fuji Photo Film Co., Ltd. Heat-sensitive recording material. 4,628,335, Cl. 346-208.000.
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Sekiguchi, Tsugio; Sato, Noboru; Igarashi, Hiroki; Ozawa, Akiyoshi; and Nakazawa, Iemi, 4,628,187, Cl. 219-505.000.
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, to Tanabe Seiyaku Co., Ltd. Tetrahydro-β-carboline derivatives and treatment of liver diseases. 4,628,057, Cl. 514-292.000.
IIT Research Institute: *See—*
Camras, Marvin, 4,628,374, Cl. 360-66.000.
Ikeda, Hideki: *See—*
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.
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Suematsu, Koshi; Ikeda, Takeshi; Yamamoto, Atsuko; Goto, Koji; and Imai, Eiichi, 4,628,019, Cl. 430-106.600.
Ikeda, Yoshiaki, to Fanuc Ltd. Color display unit. 4,628,305, Cl. 340-703.000.

Ikefuji, Yoshihiro; and Koiwa, Mitsuru, to Rohn Company Limited. Power supply having a predetermined value of input impedance. 4,628,249, Cl. 323-315.000.
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Fukuda, Shinichi; Kajiyama, Masaki; and Ikemoto, Takeshi, 4,627,289, Cl. 73-622.000.
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Nishio, Takashi; and Ikeya, Tomoyoshi, 4,627,725, Cl. 356-152.000.
Im, Jang-hi, to Dow Chemical Company, The. Method of making piezoelectric/pyroelectric elements. 4,627,138, Cl. 29-25.350.
Image S.A.: *See—*
Regnault, Luc, 4,628,329, Cl. 346-75.000.
Imagex, Inc.: *See—*
Spillman, Donald W.; and Shilling, Thomas W., 4,628,356, Cl. 358-111.000.
Imahashi, Hiromichi; Inagaki, Masahisa; Akahori, Kimihiko; and Umehara, Hajime, to Hitachi, Ltd. Method of producing high-purity metal member. 4,627,148, Cl. 29-516.000.
Imai, Eiichi: *See—*
Suematsu, Koshi; Ikeda, Takeshi; Yamamoto, Atsuko; Goto, Koji; and Imai, Eiichi, 4,628,019, Cl. 430-106.600.
Imai, Kazumichi: *See—*
Tokinaga, Daizo; Kobayashi, Teruaki; and Imai, Kazumichi, 4,628,035, Cl. 436-518.000.
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Imani, Yuichi: *See—*
Matsui, Kazuma; Hattori, Yoshiyuki; Imani, Yuichi; Kuno, Akira; and Nomura, Yoshihisa, 4,627,671, Cl. 303-116.000.
Imes, Clifford W., IV: *See—*
Thompson, Michael D.; and Imes, Clifford W., IV, 4,627,717, Cl. 355-15.000.
Imhof, Ernst; Komaroff, Iwan; Schmid, Gunther; Grunwald, Werner; and Reum, Helmut, to Robert Bosch GmbH. Apparatus for injecting fuel into combustion chambers. 4,627,405, Cl. 123-549.000.
Immunetech Pharmaceuticals: *See—*
Hahn, Gary S., 4,628,045, Cl. 514-17.000.
Imperial Chemical Industries PLC: *See—*
Porter, John E.; and Ramshaw, Colin, 4,627,890, Cl. 202-235.000.
Inagaki, Masahisa: *See—*
Imahashi, Hiromichi; Inagaki, Masahisa; Akahori, Kimihiko; and Umehara, Hajime, 4,627,148, Cl. 29-516.000.
Inao, Akitaka: *See—*
Saga, Toshihiko; Makita, Tsuyoshi; Hirono, Hisao; and Inao, Akitaka, 4,627,990, Cl. 427-10.000.
Inco Alloys International, Inc.: *See—*
Gilman, Paul S.; and Mattson, Walter E., 4,627,959, Cl. 419-61.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Dagna, Giandomenico; and Morin, Franco, 4,628,334, Cl. 346-140.00R.
Ingalls, John E.: *See—*
Colby, Lloyd E.; and Ingalls, John E., 4,628,171, Cl. 219-69.00G.
Ingersoll-Rand Company: *See—*
Hartshorn, Kevin, 4,627,464, Cl. 137-516.130.
Ingle, Edwin C.: *See—*
Chance, Christopher P.; Coble, Ralph P., Jr.; Ingle, Edwin C.; and Jones, Joye A., 4,628,157, Cl. 379-410.000.
Inland Steel Company: *See—*
Nickola, Richard A.; and Sok, Brian A., 4,628,004, Cl. 428-413.000.
Innami, Tatsuo: *See—*
Shinohara, Shigeru; Suzuki, Shun; and Innami, Tatsuo, 4,628,459, Cl. 364-475.000.
Innovation Associates: *See—*
Afromowitz, Martin A., 4,627,172, Cl. 33-366.000.
Innoventions Biomedical Inc.: *See—*
Leckrone, Michael E., 4,627,436, Cl. 128-303.100.
Inomata, Koichiro: *See—*
Sahashi, Masashi; Inomata, Koichiro; and Kobayashi, Tadahiko, 4,627,298, Cl. 73-862.360.
Inoue, Akira, to Olympus Optical Company, Ltd. Flashlight emission apparatus. 4,628,229, Cl. 315-241.00P.
Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,628,172, Cl. 219-69.00W.
Inoue, Jiro: *See—*
Nakatani, Hiroshi; Inoue, Jiro; and Miyamori, Masashige, 4,628,285, Cl. 331-163.000.
Inoue, Kaname: *See—*
Yokota, Tohru; Inoue, Kaname; Tanizawa, Ryozo; Asou, Hideyuki; and Kitamura, Hajime, 4,628,070, Cl. 524-504.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Gap energizing system for TW electroerosion. 4,628,172, Cl. 219-69.00W.
Inoue, Takao: *See—*
Shimakata, Masashi; Kawamura, Katsuaki; Tsuchiya, Toshiaki; Shioya, Yuichiro; Inoue, Takao; Syoji, Mitsuo; and Kuroda, Keiichi, 4,628,537, Cl. 455-34.000.
INRYCO, Inc.: *See—*
Presswalla, Hoshang H.; and Shea, Yale R., 4,627,203, Cl. 52-221.000.
Institut Francais du Petrole: *See—*
Bournonville, Jean-Paul; Candy, Jean-Pierre; and Mabilon, Gil, 4,628,130, Cl. 568-885.000.
Prouteau, Didier; Hagues, Francois; Chauvin, Yves; and Commereuc, Dominique, 4,628,065, Cl. 518-700.000.
Puff, Roger M.; and Dreuilhe, Jacques P., 4,627,387, Cl. 122-4.00D.
Rialan, Joseph; and Thierry, Gerard, 4,628,494, Cl. 307-79.000.
Institut Textile de France: *See—*
Chatelin, Roger; Combes, Jean-Francois; and Wattiez, Daniel, 4,627,920, Cl. 210-668.000.
Instytut Gornictwa Naftowego: *See—*
Dzwinel, Jan, 4,628,266, Cl. 324-330.000.
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Ewald, Rolf V. T., 4,628,422, Cl. 362-240.000.
International Business Machines Corporation: *See—*
Balderes, Demetrios; Frankovsky, Andrew J.; and Jarvela, Robert A., 4,628,411, Cl. 361-414.000.
Beavers, John A., 4,628,541, Cl. 455-603.000.
Brady, William A., Jr.; Jordan, Stanley R.; Morgado, Eugenio J.; Perlini, Julius J.; and Stricker, Alfred A., 4,627,829, Cl. 493-189.000.
Buonomo, Joseph P.; Losinger, Raymond E.; Oliver, Burton L.; and Sucher, Daniel J., 4,628,445, Cl. 364-200.000.
Crouse, William G., 4,628,307, Cl. 340-825.050.
DeHond, Mitchell R.; and Ledak, Paul J., 4,627,152, Cl. 29-571.000.
Herron, Lester W.; Kumar, Ananda H.; Master, Raj N.; and Nufer, Robert W., 4,627,160, Cl. 29-830.000.
Irvin, David R., 4,628,156, Cl. 379-410.000.
Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,628,385, Cl. 360-99.000.
Milling, Philip E., 4,628,311, Cl. 340-825.500.
Ruppert, Werner, 4,628,211, Cl. 250-578.000.
International Computers Limited: *See—*
Loo, Johnson, 4,628,512, Cl. 371-68.000.
Reddaway, Stewart F., 4,628,481, Cl. 364-900.000.
Thompson, Gordon L.; Gudgeon, Brian; and Wombwell, Kenneth J., 4,628,409, Cl. 361-403.000.
International Ferry Freight Limited: *See—*
Dudding, Sheron L., 4,627,549, Cl. 220-1.500.
International Flavors & Fragrances Inc.: *See—*
Hall, John B., 4,627,935, Cl. 252-522.00R.
Kiwala, Jacob; Mookherjee, Braja D.; and Trenkle, Robert W., 4,627,449, Cl. 131-276.000.
Lindauer, Jerome I.; and Reich, Sharon L., 4,627,934, Cl. 252-522.00R.
International Standard Electric Corporation: *See—*
Dorn, Reimund; Ebner, Heinz; Gundert, Johann; Halder, Ernst; Haspel, Werner; Isert, Ingo; Kuhnemann, Gunter; Lutz, Felix; Seibold, Gerhard; and Wessel, Gerhard, 4,627,687, Cl. 350-96.200.
Dorn, Reimund; and Schneider, Martin, 4,628,514, Cl. 372-36.000.
Poschmann, Werner; Klenner, Wolfgang; Wattach, Gunter; and Maas, Peter, 4,628,437, Cl. 364-131.000.
Willson, Jolyon P., 4,627,728, Cl. 356-345.000.
International Tectonics Incorporated: *See—*
Ross, David S., 4,627,923, Cl. 210-744.000.
International Telephone and Telegraph Corporation: *See—*
Vlasak, Weldon R. H., 4,628,273, Cl. 330-4.300.
IOG Industrie-Ofenbau Gesellschaft mit beschrankter Haftung: *See—*
Loges, Hans J.; and Wilkening, Hermann, 4,627,258, Cl. 72-196.000.
IRSID: *See—*
Berthet, Aristide; and Denier, Guy, 4,627,601, Cl. 266-212.000.
Irvin, David R., to International Business Machines Corporation. Canceller trained echo suppressor. 4,628,156, Cl. 379-410.000.
Ise, Yoji; Kato, Minoru; and Tachikawa, Keiichi, to Kabushiki Kaisha Myotoku. Air sliding device for work pallets or the like. 4,627,362, Cl. 104-23.200.
Isert, Ingo: *See—*
Dorn, Reimund; Ebner, Heinz; Gundert, Johann; Halder, Ernst; Haspel, Werner; Isert, Ingo; Kuhnemann, Gunter; Lutz, Felix; Seibold, Gerhard; and Wessel, Gerhard, 4,627,687, Cl. 350-96.200.
Ishida, Hiroshi; and Wang, Yujen, to Rocket Industries, Inc. Multi-purpose exercising apparatus. 4,627,610, Cl. 272-72.000.
Ishida, Takashi: *See—*
Toshimitsu, Yoshihiko; Aoyama, Toshihiko; and Ishida, Takashi, 4,627,637, Cl. 280-714.000.
Ishii, Takatoshi: *See—*
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; Okumura, Takatoshi; and Morimoto, Minoru, 4,628,467, Cl. 364-521.000.
Ishii, Yasuaki, to Ricoh Company, Ltd. Sheet feeding system. 4,627,607, Cl. 271-122.000.
Ishikake, Masanao: *See—*
Mabuchi, Akira; Uchida, Sadao; and Ishikake, Masanao, 4,627,638, Cl. 280-779.000.
Ishikawa, Chuji, to Ricoh Company, Ltd. Ink mist collection apparatus for ink jet printer. 4,628,331, Cl. 346-75.000.
Ishikawa, Noriyoshi: *See—*
Kurata, Masami; Yamamoto, Tadashi; and Ishikawa, Noriyoshi, 4,628,368, Cl. 358-293.000.
Ishiwata, Osamu: *See—*
Seki, Yasukazu; Sato, Noritada; and Ishiwata, Osamu, 4,627,991, Cl. 427-39.000.
Isler, Bonnie J. Artificial fingernails and method of application. 4,627,453, Cl. 132-73.000.
Isobe, Shinichi; and Sawada, Kazuo, to Fanuc Ltd. Centralized peripheral interface with a numerical control unit. 4,628,442, Cl. 364-167.000.
Itakura, Masato: *See—*
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Itami, Teruhiko: *See*—
Takahashi, Yuichi; Tasaki, Akira; Itami, Teruhiko; and Tomiyama, Shunsuke, 4,628,328, Cl. 346-74.400.
Ito, Hiroshi; Aida, Kanae; Shinozaki, Masanobu; Koumura, Masahiko; Tamada, Kazumi; and Mizutani, Katsushi, to Rinnai Kabushiki Kaisha. Water heater. 4,627,416, Cl. 126-351.000.
Ito, Katsumi, to Kubota, Ltd. Automatic running work vehicle. 4,628,454, Cl. 364-424.000.
Ito, Masaji: *See*—
Tani, Tatsuo; Midorikawa, Akira; Ito, Masaji; Kuno, Masashi; Shinada, Masayuki; Yoshino, Hirobumi; and Nakashima, Yoshihiro, 4,627,707, Cl. 355-14.00R.
Ito, Shinzo; and Kaneko, Yasuhiro, to Nippondenso Co., Ltd. Method and apparatus for measuring shape of injected substance. 4,628,465, Cl. 364-521.000.
Ito, Tadayoshi; and Yasunori, Taga, to Kabushiki Kaisha Toyoto Chuo Kenkyusho. Heat wave shielding lamination. 4,628,005, Cl. 428-432.000.
Ito, Tetsuro, to Mitsubishi Denki Kabushiki Kaisha. Fabricating machine. 4,628,173, Cl. 219-69.00G.
Ito, Yukinori: *See*—
Takagaki, Katsumi; Ito, Yukinori; and Sumi, Kiyohide, 4,627,521, Cl. 192-2.000.
Itoh, Isamu: *See*—
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ITT Corporation: *See*—
Goodman, David S.; and Oliver, Leland W., 4,628,410, Cl. 361-413.000.
Iwahara, Makoto; and Ogawa, Hiroshi, to Victor Company of Japan, Ltd. M-S type stereophonic microphone. 4,628,525, Cl. 381-26.000.
Iwakiri, Norio: *See*—
Bingo, Hideyuki; Yoshimura, Takashi; Yamashita, Masatsuga; Hashizume, Shinichi; and Iwakiri, Norio, 4,628,166, Cl. 200-302.100.
Iwamoto, Kenzi: *See*—
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Iwamoto, Taro: *See*—
Kamejima, Kohji; Hosoda, Yuji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; Honma, Kazuo; and Yoshida, Takashi, 4,628,453, Cl. 364-424.000.
Iwanciow, Bernard L., to United States of America, Navy. Fuel cell with storable gas generator. 4,628,010, Cl. 429-19.000.
Iwata, Kunio, to Kanai Juyo Kogyo Co., Ltd. Combing roller for an open-end spinning machine. 4,627,131, Cl. 19-97.000.
Iwatsu Electric Co., Ltd.: *See*—
Fukumura, Sadaaki; Hashimoto, Takeji; and Tano, Hirofumi, 4,628,326, Cl. 346-29.000.
Izumita, Morishi: *See*—
Mita, Seiichi; Izumita, Morishi; Umemoto, Masuo; Eto, Yoshizumi; Rokuda, Morito; and Kanada, Hidehiro, 4,628,297, Cl. 340-347.0DD.
Jacob, Gernot J. M., to Progress - Electrogeraete. Vacuum cleaner filter. 4,627,858, Cl. 55-126.000.
James River Corporation, The: *See*—
Johnson, Jeffrey J., 4,627,953, Cl. 264-518.000.
James River-Norwalk, Inc.: *See*—
Johnson, Jeffrey J., 4,627,806, Cl. 425-83.100.
Janhonen, Veikko I. Package blank and packaging method. 4,627,223, Cl. 53-449.000.
Janome Sewing Machine Co., Ltd.: *See*—
Eguchi, Yasukata, 4,627,371, Cl. 112-451.000.
Moriyama, Masaru; and Yamaguchi, Yoshio, 4,627,755, Cl. 400-662.000.
Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, to International Business Machines Corporation. Two stage colleting in a flexible disk drive. 4,628,385, Cl. 360-99.000.
Japan Tobacco Inc.: *See*—
Hyuga, Kounosuke; Nakamura, Koutaro; and Ogawa, Shouzou, 4,627,577, Cl. 241-30.000.
Japanese Foundation for Cancer Research: *See*—
Sakurai, Yoshio; and Tsuruo, Takashi, 4,628,047, Cl. 514-34.000.
Jarvela, Robert A.: *See*—
Balderes, Demetrios; Frankovsky, Andrew J.; and Jarvela, Robert A., 4,628,411, Cl. 361-414.000.
Jarvinen, Jyrki H., to Yoko-team Oy. Knee and shin protector. 4,627,108, Cl. 2-22.000.
Jennings, Barry R.; Trimm, Harold H.; and Webb, Terence W., to English Clays Lovering Pochin & Company, Ltd. Monitoring deflocculated particles in a suspension. 4,627,727, Cl. 356-338.000.
Jensen, Niels D.; and Langgaard, Gunnar, to Grundfos A/S. Rotating flow pump with a feed pump unit formed as an ejector. 4,627,792, Cl. 417-83.000.
Jeol Ltd.: *See*—
Kida, Jun, 4,628,263, Cl. 324-321.000.
Jerde, James B.; and Vasbinder, James E., to Digital Dynamics, Inc. Self-calibrating temperature probe apparatus and method for use thereof. 4,627,740, Cl. 374-1.000.
Jessup, Peter J.: *See*—
Holstedt, Richard A.; Baron, Kenneth; and Jessup, Peter J., 4,627,930, Cl. 252-49.600.
Jo, Yasunori: *See*—
Mori, Takashi; Mizu, Kouichi; and Jo, Yasunori, 4,627,316, Cl. 81-430.000.
Johansson, Eskil T. Attachment means. 4,627,777, Cl. 411-439.000.
John Fluke Mfg. Co., Inc.: *See*—
Bottman, Jeffrey S., 4,628,278, Cl. 330-149.000.
Johns Hopkins University, The: *See*—
Chubbuck, John G.; and Epstein, Melvin H., 4,627,443, Cl. 128-748.000.
Turner, Robert, 4,627,726, Cl. 356-336.000.
Zinger, William H.; and Krill, Jerry A., 4,628,287, Cl. 333-137.000.
Johns, Reginald B.; Chaffee, Alan L.; Cain, David A.; and Buchanan, Alan S., to University of Melbourne; and CRA Services Limited. Upgrading solid fuels. 4,627,575, Cl. 241-15.000.
Johnson, David E.; and Williams, Richard W., to FRL, Inc. Metal detector and classifier with automatic compensation for soil magnetic minerals and sensor misalignment. 4,628,265, Cl. 324-329.000.
Johnson, Gerald L.: *See*—
Field, Almeron J.; Whyte, Daniel G.; and Johnson, Gerald L., 4,627,767, Cl. 405-196.000.
Johnson, Jeffrey J., to James River-Norwalk, Inc. Apparatus for the manufacture of fibrous webs with helical rotor. 4,627,806, Cl. 425-83.100.
Johnson, Jeffrey J., to James River Corporation, The. Method for forming dry laid webs. 4,627,953, Cl. 264-518.000.
Johnson, Lynn F., to Double L Manufacturing. Apparatus and method for sorting produce. 4,627,541, Cl. 209-668.000.
Johnson, Michael R.: *See*—
Reed, David M.; and Johnson, Michael R., 4,627,381, Cl. 119-1.000.
Johnson, Raynor A.: *See*—
Wegener, Jack; Johnson, Raynor A.; and Weedling, Robert, 4,627,426, Cl. 128-132.00R.
Johnson, Samuel C.; and Elliott, James C., to Dresser Industries, Inc. Air seal between relatively moveable ducts. 4,627,625, Cl. 277-27.000.
Johnston, Barry W. Closed loop solar collector system powering a self-starting uniflow steam engine. 4,627,241, Cl. 60-656.000.
Johnston, Howard; and Troxell, Lillian H., to Dow Chemical Company, The. Trifluoromethyl pyridinyloxyphenoxy propanoic acid chlorides. 4,628,099, Cl. 546-302.000.
Johnston, James S.; Holland, Leslie; and Wright, Christopher R., to Rosemount Engineering Company Limited. Method of producing a resistance element for a resistance thermometer. 4,627,902, Cl. 204-192.210.
Johnston, Kent H.: *See*—
Smith, Kenneth R.; Johnston, Kent H.; LaRue, George S.; Mueller, Robert A.; and Tabor, Steven A., 4,628,406, Cl. 361-386.000.
Johnstone, David L., to Tom McGuane Industries, Inc. Fuel pressure regulator. 4,627,463, Cl. 137-510.000.
Johnstone, Richard; Kirkham, Edward E.; Chung, Han C.; and Ostby, Lyle D., to Kearney & Trecker Corporation. Automatic dynamic error compensator. 4,628,441, Cl. 364-167.000.
Jones, Joye A.: *See*—
Chance, Christopher P.; Coble, Ralph P., Jr.; Ingle, Edwin C.; and Jones, Joye A., 4,628,157, Cl. 379-410.000.
Jones, Juliana C. Table covering apparatus. 4,627,363, Cl. 108-90.000.
Jones, Robert L.; and Wilson, Norman H., to National Research Development Corporation. Prostaglandins. 4,628,061, Cl. 514-469.000.
Jones, Stanley C., to Marathon Oil Company. System for measuring the pore volume and permeability of very tight core plugs and method therefor. 4,627,270, Cl. 73-38.000.
Jordan, Stanley R.: *See*—
Brady, William A., Jr.; Jordan, Stanley R.; Morgado, Eugenio J.; Perlini, Julius J.; and Stricker, Alfred A., 4,627,829, Cl. 493-189.000.
Josef Uhlmann Maschinenfabrik GmbH & Co. KG: *See*—
Faller, Peter; Rittinger, Herbert; and Gertitschke, Detlev, 4,627,225, Cl. 53-510.000.
Josephson, Lee: *See*—
Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., 4,628,037, Cl. 436-526.000.
Jourdan, James K.: *See*—
Anderson, Leland J.; Jourdan, James K.; and Marschke, Carl R., 4,627,214, Cl. 83-71.000.
Jujo Paper Co., Ltd.: *See*—
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,628,336, Cl. 346-209.000.
Jung, Kwan S. Barbecue grill. 4,627,410, Cl. 126-25.00A.
Jungbluth, Werner W.: *See*—
Rodloff, Rudiger K.; and Jungbluth, Werner W., 4,628,515, Cl. 372-107.000.
Jungerman, Roger L.; and Kino, Gordon S., to Leland Stanford Junior University, The Board of Trustees of the. Optical scanning microscope. 4,627,730, Cl. 356-349.000.
Just, Herbert: *See*—
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Juy, Henri. Device for the assembly especially of the joint of the chain-guide tensioning arm of the speed change gears for bicycles and similar vehicles. 4,627,827, Cl. 474-80.000.
Juziuk, Peter M.; and Hazebrook, Daniel W., to GKN Automotive Components Inc. Multi-segment, non-flexible boot for mechanical joint. 4,627,826, Cl. 464-171.000.
Jyojiki, Masao: *See*—
Nakamura, Kazuo; Jyojiki, Masao; and Aoki, Harumi, 4,627,700, Cl. 354-409.000.
K. C. Shen Technology International Ltd.: *See*—
Shen, Kuo C., 4,627,951, Cl. 264-109.000.
K. J. Baillie Pty. Ltd.: *See*—
Gordon, Patrick J., 4,627,461, Cl. 137-243.100.

Kaaden, Jurgen: *See*—
Geiger, Erich; Otto, Bernhard; and Kaaden, Jurgen, 4,628,345, Cl. 358-13.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Kawaguchi, Hatsuo, 4,627,641, Cl. 283-81.000.
Kabushiki Kaisha Myotoku: *See*—
Ise, Yoji; Kato, Minoru; and Tachikawa, Keiichi, 4,627,362, Cl. 104-23.200.
Kabushiki Kaisha Nagaoka: *See*—
Kawabe, Hirokazu, 4,628,388, Cl. 360-128.000.
Kabushiki Kaisha Sankosha: *See*—
Shigemori, Daizo; and Muramatsu, Yuji, 4,628,399, Cl. 361-120.000.
Kabushiki Kaisha Tetrak: *See*—
Kojima, Koji; and Kajiwara, Kiyosi, 4,628,176, Cl. 219-110.000.
Kabushiki Kaisha Toshiba: *See*—
Abuyama, Yasuo, 4,627,713, Cl. 355-14.00R.
Hashizume, Kenichi, 4,628,142, Cl. 136-246.000.
Sahashi, Masashi; Inomata, Koichiro; and Kobayashi, Tadahiko, 4,627,298, Cl. 73-862.360.
Sakui, Koji, 4,628,486, Cl. 365-149.000.
Kabushiki Kaisha Toyoto Chuo Kenkyusho: *See*—
Ito, Tadayoshi; and Yasunori, Taga, 4,628,005, Cl. 428-432.000.
Kabushiki Kaisha Tsuchiya Seisakusho: *See*—
Namiki, Kyoji; Abe, Shunji; Yamashita, Shigeki; and Kashiwaba, Yukio, 4,627,406, Cl. 123-573.000.
Kadwell, Brian J.: *See*—
Fowler, Daniel L.; and Kadwell, Brian J., 4,628,439, Cl. 364-138.000.
Kaeppeli, Othmar; and Guerra-Santos, Luis, to Petrotec Forschungs AG. Process for the production of rhamnolipids. 4,628,030, Cl. 435-101.000.
Kafkis, Nick H. Vessel closures and method of forming the closures. 4,627,538, Cl. 206-524.100.
Kagawa, Hiroshi, to Yuasa Battery Co., Ltd. Sodium-sulfur storage battery and a manufacturing method of the same. 4,627,996, Cl. 428-104.000.
Kageyama, Hidehei, to Kotobuki & Co., Ltd. Lead propelling mechanism for a mechanical pencil. 4,627,756, Cl. 401-94.000.
Kagi, Otto, to Stopinc Aktiengesellschaft. Method of constructing a refractory plate assembly for use in a sliding closure unit. 4,627,147, Cl. 29-515.000.
Kagomoto, Yoshiteru, to Matsushita Electric Industrial Co., Ltd. Cooking appliance of hot air circulation type. 4,627,409, Cl. 126-21.00A.
Kai, Tadashi, to Asahi Kasei Kogyo Kabushiki Kaisha. Synthesis of crystalline aluminosilicate with alkylurea or alkylthiourea. 4,627,968, Cl. 423-329.000.
Kaiser, Carl: *See*—
Finkelstein, Joseph A.; Kaiser, Carl; and Kruse, Lawrence I., 4,628,059, Cl. 514-384.000.
Kajima Corporation: *See*—
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.
Kajiwara, Kiyosi: *See*—
Kojima, Koji; and Kajiwara, Kiyosi, 4,628,176, Cl. 219-110.000.
Kajiyama, Masaki: *See*—
Fukuda, Shinichi; Kajiyama, Masaki; and Ikemoto, Takeshi, 4,627,289, Cl. 73-622.000.
Kakizoe, Masahiro: *See*—
Mori, Teijiro; Wada, Yuichi; Kakizoe, Masahiro; Masuda, Shigeru; and Nishizako, Shizutaka, 4,628,163, Cl. 200-144.00R.
Kalfoglou, George, to Texaco Inc. Method of using a lignosulfonate/-carbohydrate system as a sacrificial agent for surfactant flooding. 4,627,494, Cl. 166-274.000.
Kamakura, Masashi: *See*—
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.
Kamejima, Kohji; Hosoda, Yuji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; Honma, Kazuo; and Yoshida, Takashi, to Hitachi, Ltd. Navigation apparatus for mobile system. 4,628,453, Cl. 364-424.000.
Kaminski, Les K.; and Dyke, Michael E., to Chrysler Motors Corporation. Combination dome/cargo lamp. 4,628,417, Cl. 362-74.000.
Kamm, Roger D.; and Fine, Louis. Tobacco smoke article holder and method therefor. 4,627,448, Cl. 131-187.000.
Kamo, Tetuo; Miyagawa, Junichi; Okada, Kazuichi; and Shiota, Eiji, to Matsushita Electric Industrial Co., Ltd. Cooking stove having removable top plate. 4,627,415, Cl. 126-299.00R.
Kampe, Klaus-Dieter: *See*—
Schmidt, Erwin; Gunther, Dieter; and Kampe, Klaus-Dieter, 4,628,109, Cl. 560-13.000.
Kampner, Stanley L. Portable traction device. 4,627,423, Cl. 128-75.000.
Kan, Tsuneo: *See*—
Ibaraki, Yoshiro; Kawabata, Toshiaki; Kan, Tsuneo; and Kishi, Atsuo, 4,627,861, Cl. 55-278.000.
Kanada, Hidehiro: *See*—
Mita, Seiichi; Izumita, Morishi; Umemoto, Masuo; Eto, Yoshizumi; Rokuda, Morito; and Kanada, Hidehiro, 4,628,297, Cl. 340-347.0DD.
Kanai Juyo Kogyo Co., Ltd.: *See*—
Iwata, Kunio, 4,627,131, Cl. 19-97.000.
Kanamori, Hiroo; Tanaka, Gotaro; and Chida, Kazunori, to Sumitomo Electric Industries Ltd.; and Nippon Telegraph and Telephone Public Corporation. Method for producing optical fiber preform. 4,627,866, Cl. 65-3.120.
Kanamori, Hiroo: *See*—
Tanaka, Gotaro; Kanamori, Hiroo; and Mizutani, Futoshi, 4,627,867, Cl. 65-3.120.
Kanayama, Katsumi: *See*—
Motoyama, Kazuyasu; and Kanayama, Katsumi, 4,628,390, Cl. 360-137.000.
Kanda, Mikio: *See*—
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,628,456, Cl. 364-449.000.
Kanebo, Ltd.: *See*—
Matsui, Masao; Naito, Hiroshi; and Osagawa, Takao, 4,627,950, Cl. 264-103.000.
Yata, Shizukuni; and Hato, Yukinori, 4,628,015, Cl. 429-194.000.
Kanebo Synthetic Fibers, Ltd.: *See*—
Matsui, Masao; Naito, Hiroshi; and Osagawa, Takao, 4,627,950, Cl. 264-103.000.
Kanehara, Kenji: *See*—
Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, 4,627,279, Cl. 73-195.000.
Kaneko, Ryohei: *See*—
Shimano, Kimihide; Shimamura, Haruo; Yamaguchi, Hiroshi; Murayama, Hiroshi; Kaneko, Ryohei; and Seki, Katsura, 4,627,981, Cl. 424-84.000.
Kaneko, Yasuhiro: *See*—
Ito, Shinzo; and Kaneko, Yasuhiro, 4,628,465, Cl. 364-521.000.
Kaneko, Youji, to Casio Computer Co., Ltd. Touch response apparatus for electronic musical apparatus. 4,627,325, Cl. 84-1.260.
Kanemitsu, Shinji: *See*—
Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; Toriumi, Mototada; and Nishino, Fumio, 4,627,701, Cl. 355-3.0CH.
Kaneyuki, Kazutoshi, to Mitsubishi Denki Kabushiki Kaisha. Accessory drive device in engine. 4,627,309, Cl. 74-752.00C.
Kano, Hayao: *See*—
Shingo, Ichikawa; Nakagawa, Hisahide; Kano, Hayao; and Kudo, Koji, 4,627,739, Cl. 368-282.000.
Kao, Chung-fu. Watchcase and watchframe assembly. 4,627,738, Cl. 368-281.000.
Karbach, Stefan: *See*—
Rentzea, Costin; Karbach, Stefan; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,628,058, Cl. 514-383.000.
Karl G. Marbach GmbH & Co.: *See*—
Marbach, Karl G., 4,627,580, Cl. 241-101.400.
Karn, Jack L., to Lubrizol Corporation, The. Basic non-carbonated magnesium compositions and fuel, lubricant and additive concentrate compositions containing same. 4,627,928, Cl. 252-33.000.
Karubian, Ralph K.; and Coelho, Gregorio J., to Kentmaster Mfg. Co., Inc. Leg shear. 4,627,167, Cl. 30-228.000.
Kashiwa, Masahiro; Onosato, Masashi; and Takahashi, Hiroshi, to NEC Corporation. Chroma-key tracking apparatus. 4,628,363, Cl. 358-183.000.
Kashiwaba, Yukio: *See*—
Namiki, Kyoji; Abe, Shunji; Yamashita, Shigeki; and Kashiwaba, Yukio, 4,627,406, Cl. 123-573.000.
Katada, Hiroshi: *See*—
Yoshida, Tatsuya; and Katada, Hiroshi, 4,627,399, Cl. 123-419.000.
Katakura, Kageyoshi: *See*—
Ogawa, Toshio; Katakura, Kageyoshi; and Umemura, Shinichiro, 4,627,290, Cl. 73-628.000.
Takeuchi, Hiroshi; Nakaya, Chitose; Umemura, Shinichiro; and Katakura, Kageyoshi, 4,628,223, Cl. 310-358.000.
Kather, Kenneth C.: *See*—
BeVier, William E.; Kather, Kenneth C.; and Graczyk, Lawrence S., 4,627,456, Cl. 137-1.000.
Katkocin, Dennis M.; Zeman, Nancy W.; and Yang, Shiow-Shong, to CPC International Inc. Novel thermostable pullulanase enzyme and method for its production. 4,628,028, Cl. 435-95.000.
Kato, Kimitoshi; Aiga, Hiroshi; Mikoda, Tamio; and Sakai, Tunehiro, to Mitsui Toatsu Chemicals, Inc. Process for producing dianthraquinone-N,N'-dihydrazine and its chlorination product. 4,628,091, Cl. 544-339.000.
Kato, Masaaki; Nakatsuka, Hirotaka; Tojo, Shigeki; and Arai, Kazuyoshi, to Nippondenso Co., Ltd. Fuel injection nozzle. 4,627,571, Cl. 239-90.000.
Kato, Masahiro; and Ogawa, Tetsu, to Canon Denshi Kabushiki Kaisha. Magnetic disc unit. 4,628,376, Cl. 360-71.000.
Kato, Minoru: *See*—
Ise, Yoji; Kato, Minoru; and Tachikawa, Keiichi, 4,627,362, Cl. 104-23.200.
Kato, Shinichi; Watanabe, Kiyoto; Saito, Yoji; and Yamagata, Akio, to Nissan Motor Company, Ltd.; and Yazaki Corporation. Screw type connector set. 4,627,759, Cl. 403-2.000.
Kato, Tadaaki: *See*—
Maeda, Yuji; Yamato, Hideyuki; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,628,050, Cl. 514-167.000.
Kato, Toshiro, to Sumitomo Chemical Company, Limited. Fungicidal composition comprising a synergistic mixture of a cycloimide fungicide and tolclofos-methyl. 4,628,049, Cl. 514-147.000.
Katz, Alan J.: *See*—
Thompson, Arthur H.; Katz, Alan J.; and Krohn, Christine E., 4,628,468, Cl. 364-556.000.

Katz, Harry R. Needle inserting instrument for interstitial radiotherapy. 4,627,420, Cl. 128-1.100.
Katz, Morton. High temperature heat seal film. 4,628,003, Cl. 428-377.000.
Katz, William. Intravenous needle assembly. 4,627,842, Cl. 604-177.000.
Kauffman, Brad. Exercise apparatus. 4,627,616, Cl. 272-120.000.
Kauffman, Stephen R. Impact training device. 4,627,611, Cl. 272-77.000.
Kaveh, Farrokh, to Owens-Corning Fiberglas Corporation. Method and apparatus for producing mineral fibers. 4,627,868, Cl. 65-6.000.
Kawabata, Toshiaki: *See*—
Ibaraki, Yoshiro; Kawabata, Toshiaki; Kan, Tsuneo; and Kishi, Atsuo, 4,627,861, Cl. 55-278.000.
Kawabe, Hirokazu, to Kabushiki Kaisha Nagaoka. Head cleaning apparatus. 4,628,388, Cl. 360-128.000.
Kawaguchi, Hatsuo, to Kabushiki Kaisha Ishida Koki Seisakusho. Two-color thermosensitive label. 4,627,641, Cl. 283-81.000.
Kawaguchi, Ikuo, to Hitachi, Ltd. Testing apparatus for redundant memory. 4,628,509, Cl. 371-21.000.
Kawai, Makoto: *See*—
Hayashi, Chikahisa; Kawai, Makoto; and Adachi, Mikio, 4,627,280, Cl. 73-290.00R.
Kawamura, Katsuaki: *See*—
Shimakata, Masashi; Kawamura, Katsuaki; Tsuchiya, Toshiaki; Shioya, Yuichiro; Inoue, Takao; Syoji, Mitsuo; and Kuroda, Keiichi, 4,628,537, Cl. 455-34.000.
Kawamura, Yoshizi: *See*—
Kobayashi, Takeshi; Endo, Kazuo; Nanbu, Nobumasa; and Kawamura, Yoshizi, 4,627,688, Cl. 350-173.000.
Kawano, Tsuyoshi; Sanagi, Shiroh; and Nakajima, Koe, to Nippon Steel Corporation. Cold rolled steel sheet having excellent press formability and method for producing the same. 4,627,881, Cl. 148-12.00C.
Kawaoto, Yoshio: *See*—
Hamamoto, Atsushi; and Kawaoto, Yoshio, 4,627,201, Cl. 52-208.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Hamamoto, Atsushi; and Kawaoto, Yoshio, 4,627,201, Cl. 52-208.000.
Nishida, Hiroshi, 4,627,373, Cl. 114-182.000.
Nishimune, Hisaaki; Ichimura, Yoshikuni; and Hata, Kentaro, 4,627,239, Cl. 60-484.000.
Kayser, Dennis J., to Wang Laboratories, Inc. Power supply on/off switching with inrush limiting. 4,628,431, Cl. 363-49.000.
Kazaitis, Michael P.: *See*—
Nausedas, Joseph A.; and Kazaitis, Michael P., 4,627,130, Cl. 17-1.00R.
KB Electronics Inc.: *See*—
Saganovsky, Abraham; and Chester, William, 4,628,232, Cl. 318-284.000.
Kearney & Trecker Corporation: *See*—
Johnstone, Richard; Kirkham, Edward E.; Chung, Han C.; and Ostby, Lyle D., 4,628,441, Cl. 364-167.000.
Keim, Dieter; and Fischer, Helmut, to W. C. Heraeus GmbH. Electrode for laser stimulation lamps. 4,628,225, Cl. 313-631.000.
Keisers, Laurenz; Artz, Gerd; Figge, Dieter; Philipp, Clemens; and Siemer, Hans, to Didier-Werke AG. Refractory conduit assembly for supplying molten steel from a discharge vessel to an ingot mold. 4,627,481, Cl. 164-440.000.
Kellaway, Michael J.: *See*—
Archer, John R.; Kellaway, Michael J.; and MacArthur, Douglas S., 4,627,255, Cl. 72-10.000.
Kellner, Gerd: *See*—
Brachert, Heinrich; Girke, Dieter; and Kellner, Gerd, 4,627,352, Cl. 102-290.000.
Kelly, Felix T.; Newey, David C.; and Sutton, Gordon W., to British Petroleum Company p.l.c., The. Fluidized bed combustor. 4,627,812, Cl. 431-7.000.
Kemppainen, Nels E.: *See*—
Deitch, James C.; Kemppainen, Nels E.; Bradley, James D.; and Pfeffer, George B., 4,628,159, Cl. 200-51.050.
Kennametal, Inc.: *See*—
Ewing, Paul E.; and Grubb, B. Randall, 4,627,665, Cl. 299-79.000.
Kentmaster Mfg. Co., Inc.: *See*—
Karubian, Ralph K.; and Coelho, Gregorio J., 4,627,167, Cl. 30-228.000.
Kernforschungsanlage Julich GmbH: *See*—
Brixy, Heinz; and Hoewener, Hubert, 4,627,744, Cl. 374-175.000.
Kernforschungszentrum Karlsruhe GmbH: *See*—
Gompper, Klaus, 4,627,937, Cl. 252-631.000.
Kesling, Haven S., Jr.; and Harris, James J., to Atlantic Richfield Company. Anti-static styrene polymer particles by coating. 4,628,068, Cl. 521-57.000.
Kessel, Bernhard. Pipe fitting. 4,627,646, Cl. 285-114.000.
Keutgen, Franz: *See*—
Voss-Spilker, Peter; Reichelt, Wolfgang; Kubon, Achim; and Keutgen, Franz, 4,628,516, Cl. 373-72.000.
Keyes, Marion A., IV; and Shaffer, Jeremiah J., to Babcock & Wilcox Company, The. Adaptive gain compressor surge control system. 4,627,788, Cl. 415-11.000.
Kezios, Stothe P.: *See*—
Symbas, Panagiotis N.; Baisden, J. Lee; and Kezios, Stothe P., 4,627,421, Cl. 128-20.000.
Kibby, Gordon R.: *See*—
McCutchan, Diane R.; Roeding, Gretchen W.; and Kibby, Gordon R., 4,627,587, Cl. 244-122.00R.
Kida, Jun, to Jeol Ltd. Nuclear magnetic resonance spectrometer. 4,628,263, Cl. 324-321.000.
Kiehne, Hartmut: *See*—
Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, 4,628,062, Cl. 514-569.000.
Kieninger, Walter. Milling-cutter. 4,627,771, Cl. 407-39.000.
Kikkawa, Nobuyuki: *See*—
Takematsu, Tetsuo; Kikkawa, Nobuyuki; and Ogawa, Hideaki, 4,627,874, Cl. 71-118.000.
Kikuno, Mitsutoyo, to Ricoh Company, Ltd. Programmable copier. 4,627,715, Cl. 355-14.00R.
Kim, Hiemi: *See*—
Christiansen, Richard L.; and Kim, Hiemi, 4,627,273, Cl. 73-61.10R.
Kim, Sung B. Combination lock. 4,627,250, Cl. 70-214.000.
Kimberly-Clark Corporation: *See*—
Lassen, Frederich O.; Masten, Dianne S.; Schultz, Cheri L.; and Peerenboom, Robert J., 4,627,848, Cl. 604-370.000.
Walton, Richard R.; Walton, Richard C.; Munchbach, George E.; and Young, Robert W., 4,627,849, Cl. 604-379.000.
Kimijima, Yoshiaki: *See*—
Sawada, Katsuji; Kimijima, Yoshiaki; and Umehara, Hidetoshi, 4,627,412, Cl. 126-110.00B.
Kimoto, Sanshiro; Kokubo, Hisao; Yamabayashi, Yasunobu; and Hidejima, Kenichi. Eddy current defect-detecting system for determining an inner or outer defect and its depth in metal tubes. 4,628,260, Cl. 324-220.000.
Kimura, Kiyoshi, to Alps Electric Co., Ltd. Input device. 4,628,408, Cl. 361-395.000.
Kindermann, Wolfgang; Kloster, Ernst; Leupers, Hans-Joachim; and Schaper, Helmut, to Kraftwerk Union Aktiengesellschaft. Compact electrohydraulic drive for valves of turbomachines, especially turbines. 4,627,235, Cl. 60-415.000.
King, Edwin H. Pointer for liquid filled gauges. 4,627,285, Cl. 73-430.000.
Kino, Gordon S.: *See*—
Jungerman, Roger L.; and Kino, Gordon S., 4,627,730, Cl. 356-349.000.
Kinoshita, Jiro: *See*—
Kurakake, Mitsuo; Sakamoto, Keiji; and Kinoshita, Jiro, 4,628,240, Cl. 318-723.000.
Kircher, Klaus: *See*—
Dhein, Rolf; Meier, Helmut M.; Meissner, Hans J.; Kircher, Klaus; and Oels, Udo, 4,627,949, Cl. 264-101.000.
Kirchner, Balthasar; and Schleicher, Siegfried, to Ernst Stadelmann Gesellschaft m.b.H. Container for magnetic tape cassettes. 4,627,535, Cl. 206-387.000.
Kirkham, Edward E.: *See*—
Johnstone, Richard; Kirkham, Edward E.; Chung, Han C.; and Ostby, Lyle D., 4,628,441, Cl. 364-167.000.
Kirton, Alan J.: *See*—
Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,628,385, Cl. 360-99.000.
Kishi, Atsuo: *See*—
Ibaraki, Yoshiro; Kawabata, Toshiaki; Kan, Tsuneo; and Kishi, Atsuo, 4,627,861, Cl. 55-278.000.
Kishimoto, Kazuo: *See*—
Kobayashi, Yoshio; Tobita, Kuniharu; and Kishimoto, Kazuo, 4,627,804, Cl. 425-71.000.
Kitagawa Industries Co., Ltd.: *See*—
Yagi, Masaru; Fujimoto, Nobuaki; and Hayashi, Yoshitoki, 4,627,760, Cl. 403-201.000.
Yagi, Masaru; Fujimoto, Nobuaki; and Hayashi, Yoshitoki, 4,627,760, Cl. 403-201.000.
Kitagawa, Tohru; and Sakamoto, Koichiro, to Tokyo Electric Co., Ltd. Load cell. 4,628,296, Cl. 338-3.000.
Kitahara, Makoto: *See*—
Kitajima, Tadayuki; Kitahara, Makoto; and Murakami, Koichi, 4,627,709, Cl. 355-14.0SH.
Kitajima, Tadayuki; Kitahara, Makoto; and Murakami, Koichi, to Canon Kabushiki Kaisha. Automatic sheet feeder and an image recording apparatus provided therewith. 4,627,709, Cl. 355-14.0SH.
Kitamura, Hajime: *See*—
Yokota, Tohru; Inoue, Kaname; Tanizawa, Ryozo; Asou, Hideyuki; and Kitamura, Hajime, 4,628,070, Cl. 524-504.000.
Kitsukawa, Motohiko; and Suzuki, Atsuo, to Hashimoto Forming Industry Co., Ltd. Cutting device for a multi-dimensional bending apparatus. 4,627,254, Cl. 72-6.000.
Kittel, Arthur; and Gerken, Heiner, to Olympia Werke AG. Receiving arrangement for a multiple type carrier for an impact printer. 4,627,750, Cl. 400-144.200.
Kiuchi, Manabu. Mesh band. 4,627,231, Cl. 59-80.000.
Kiwala, Jacob; Mookherjee, Braja D.; and Trenkle, Robert W., to International Flavors & Fragrances Inc. Process for augmenting or enhancing aroma or taste of smoking tobacco and smoking tobacco article using aldehyde composition. 4,627,449, Cl. 131-276.000.
Kiya, Nobuyuki: *See*—
Nozawa, Ryoichiro; Kiya, Nobuyuki; and Yoshino, Motoaki, 4,628,444, Cl. 364-188.000.
Kiyohara, Kazuto: *See*—
Komaita, Toshiki; Nakadate, Takanori; Funabashi, Yoshiyuki; and Kiyohara, Kazuto, 4,628,025, Cl. 430-533.000.
Kiyomitsu, Isao: *See*—
Gokimoto, Hiroyuki; and Kiyomitsu, Isao, 4,627,656, Cl. 296-65.00R.

Kiyota, Satoru: *See*—
Matsubayashi, Shinji; Kiyota, Satoru; and Hosoya, Eiji, 4,627,520, Cl. 188-18.00R.

Klee, David J.; Burke, Thomas W.; and Miller, Scott A., to Air Products and Chemicals, Inc. Process control for cryogenic decoating. 4,627,197, Cl. 51-319.000.

Kleeberg, Ulrich: *See*—
Hegemann, Karl-Rudolf; and Kleeberg, Ulrich, 4,627,965, Cl. 423-242.000.

Kleemann, Axel: *See*—
Drauz, Karlheinz; and Kleemann, Axel, 4,628,126, Cl. 568-771.000.

Klein, Gerhard: *See*—
Winkel, Jens; Klein, Gerhard; Meier, Helmut-Martin; Suling, Carlhans; and Arlt, Dieter, 4,628,112, Cl. 560-160.000.

Klein, Max. Filter for air handling equipment. 4,627,863, Cl. 55-354.000.

Klein, Thomas A.; and Baker, Peter M., to Lear Siegler, Inc. Vertically-adjustable desk structure. 4,627,364, Cl. 108-147.000.

Klemm, Karl-Wilhelm: *See*—
Fries, Werner; and Klemm, Karl-Wilhelm, 4,627,876, Cl. 106-27.000.

Klenner, Wolfgang: *See*—
Poschmann, Werner; Klenner, Wolfgang; Wattach, Gunter; and Maas, Peter, 4,628,437, Cl. 364-131.000.

Klimt, Hans U. Inhalator apparatus. 4,627,430, Cl. 128-200.170.

Klobucar, W. Dirk, to Ethyl Corporation. Phosphazene trimer purification. 4,627,967, Cl. 423-300.000.

Kloster, Ernst: *See*—
Kindermann, Wolfgang; Kloster, Ernst; Leupers, Hans-Joachim; and Schaper, Helmut, 4,627,235, Cl. 60-415.000.

Kneisel, Thomas F.: *See*—
Marko, Paul D.; Kneisel, Thomas F.; and Garay, Oscar M., 4,628,322, Cl. 343-702.000.

Kobayashi, Hidetoshi; Mihayashi, Keiji; and Itoh, Isamu, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,628,024, Cl. 430-376.000.

Kobayashi, Masatsune; Eida, Tsuyoshi; Koike, Shoji; and Nakousai, Keiko, to Canon Kabushiki Kaisha. Recording liquid. 4,627,875, Cl. 106-22.000.

Kobayashi, Tadahiko: *See*—
Sahashi, Masashi; Inomata, Koichiro; and Kobayashi, Tadahiko, 4,627,298, Cl. 73-862.360.

Kobayashi, Takeshi; Endo, Kazuo; Nanbu, Nobumasa; and Kawamura, Yoshizi, to Sano Kiko Co., Ltd. Beam splitter. 4,627,688, Cl. 350-173.000.

Kobayashi, Teruaki: *See*—
Tokinaga, Daizo; Kobayashi, Teruaki; and Imai, Kazumichi, 4,628,035, Cl. 436-518.000.

Kobayashi, Yasuhiko: *See*—
Maeda, Yuji; Yamato, Hideyuki; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,628,050, Cl. 514-167.000.

Kobayashi, Yoshiaki: *See*—
Fujihisa, Hiroaki; Ohishi, Hirotoshi; Fujii, Hiroshi; and Kobayashi, Yoshiaki, 4,628,288, Cl. 335-166.000.

Kobayashi, Yoshio; Tobita, Kuniharu; and Kishimoto, Kazuo, to Mitsubishi Jukogyo Kabushiki Kaisha. Sheet forming apparatus. 4,627,804, Cl. 425-71.000.

Koch, Rudolf, to Siemens Aktiengesellschaft. Two-dimensional semiconductor image sensor including an arrangement for reducing blooming. 4,628,364, Cl. 358-213.000.

Kocher, Mark J.: *See*—
Gareis, Ronald E.; and Kocher, Mark J., 4,628,397, Cl. 361-98.000.

Kohama, Tokio: *See*—
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,627,404, Cl. 123-492.000.

Koike, Hiroshi, to Hitachi, Ltd. Electronic spark advance-type ignition system. 4,627,398, Cl. 123-418.000.

Koike, Shoji: *See*—
Kobayashi, Masatsune; Eida, Tsuyoshi; Koike, Shoji; and Nakousai, Keiko, 4,627,875, Cl. 106-22.000.

Koiwa, Mitsuru: *See*—
Ikefuji, Yoshihiro; and Koiwa, Mitsuru, 4,628,249, Cl. 323-315.000.

Kojima, Koji; and Kajiwara, Kiyosi, to Kabushiki Kaisha Tetrak. Apparatus for setting schedules of a resistance welding machine. 4,628,176, Cl. 219-110.000.

Kokubo, Hisao: *See*—
Kimoto, Sanshiro; Kokubo, Hisao; Yamabayashi, Yasunobu; and Hidejima, Kenichi, 4,628,260, Cl. 324-220.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Tanaka, Fujio; Nagao, Yasuyuki; and Imamura, Nobutake, 4,628,485, Cl. 365-122.000.

Kolcio, Nestor; and Peszlen, Richard A. Protective cover for electrical conductors. 4,628,145, Cl. 174-5.00R.

Koleda, Michael T. Vibration damping units and vibration damped products. 4,627,635, Cl. 280-602.000.

Kolibas, James A.; and Mueller, William P., to Nordson Corporation. Color changer. 4,627,465, Cl. 137-563.000.

Komai, Kensaku: *See*—
Shiono, Fusahiro; and Komai, Kensaku, 4,628,452, Cl. 364-405.000.

Komaita, Toshiki; Nakadate, Takanori; Funabashi, Yoshiyuki; and Kiyohara, Kazuto, to Konishiroku Photo Industry Co., Ltd. Polyester support for photographic use. 4,628,025, Cl. 430-533.000.

Komaki, Shigeki, to Sharp Kabushiki Kaisha. Thin card-type electronic apparatus. 4,627,736, Cl. 368-88.000.

Komanduri, Ranga; and Reed, William R., Jr., to General Electric Company. Consumable ceramic ledge tool. 4,627,317, Cl. 82-1.00C.

Komaroff, Iwan: *See*—
Imhof, Ernst; Komaroff, Iwan; Schmid, Gunther; Grunwald, Werner; and Reum, Helmut, 4,627,405, Cl. 123-549.000.

Komatsu, Yasuto: *See*—
Murakami, Shigeru; Komatsu, Yasuto; Watanabe, Makoto; and Uemura, Takeo, 4,627,944, Cl. 264-29.400.

Komatsu, Yuji, to NEC Corporation. Semiconductor integrated circuit device free from mutual interference between circuit blocks formed therein. 4,628,343, Cl. 357-84.000.

Komiyama, Choji; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette storage case. 4,627,534, Cl. 206-387.000.

Komoda, Norihis: *See*—
Tashiro, Tsutomu; Haruna, Koichi; and Komoda, Norihis, 4,628,435, Cl. 364-130.000.

Komoda, Norihisa: *See*—
Tashiro, Tsutomu; Haruna, Koichi; and Komoda, Norihisa, 4,628,434, Cl. 364-130.000.

Kon, Shigeki, to Tachikawa Spring Co. Ltd. Button for an automotive seat. 4,627,660, Cl. 297-219.000.

Kondo, Shiro: *See*—
Mizuta, Ken; and Kondo, Shiro, 4,628,234, Cl. 318-267.000.

Konicek, Lawrence R.: *See*—
Gombrich, Peter P.; Case, Steven K.; and Konicek, Lawrence R., 4,628,313, Cl. 340-870.020.

Konishiroku Photo Industry Co., Ltd.: *See*—
Komaita, Toshiki; Nakadate, Takanori; Funabashi, Yoshiyuki; and Kiyohara, Kazuto, 4,628,025, Cl. 430-533.000.
Nozaki, Hiromi, 4,627,714, Cl. 355-14.0FU.
Takahashi, Seiji; Miyazaki, Masayuki; Hirabayashi, Tsugio; and Maekawa, Yoshikazu, 4,627,706, Cl. 355-14.0SH.

Kopp, Raun A., to Oatey Co. Dispenser system and method for dispensing putty-like material. 4,627,551, Cl. 222-1.000.

Koroyasu, Arata, to Kyokuto Sanki Kabushiki Kaisha. Carpet stretcher. 4,627,653, Cl. 294-8.600.

Kort, Eckehard K. Annular gap magnet system, particularly for low frequency loudspeakers. 4,628,154, Cl. 381-189.000.

Kot, Norbert J.: *See*—
Olson, Gene E.; and Kot, Norbert J., 4,627,761, Cl. 403-324.000.

Kotobuki & Co., Ltd.: *See*—
Kageyama, Hidehei, 4,627,756, Cl. 401-94.000.

Kotthaus, Erich, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Gear cutter. 4,627,770, Cl. 407-21.000.

Koumura, Masahiko: *See*—
Ito, Hiroshi; Aida, Kanae; Shinozaki, Masanobu; Koumura, Masahiko; Tamada, Kazumi; and Mizutani, Katsushi, 4,627,416, Cl. 126-351.000.

Kovacs, Zoltan: *See*—
Herbert, Donald L.; Schneider, Lynn A.; and Kovacs, Zoltan, 4,627,545, Cl. 213-100.00R.

Koyama, Seiichi: *See*—
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Elfert, Bernd; and Scholly, Werner, 4,628,207, Cl. 250-461.100.
Kindermann, Wolfgang; Kloster, Ernst; Leupers, Hans-Joachim; and Schaper, Helmut, 4,627,235, Cl. 60-415.000.

Kramer, Irvin R.; and Reader, Wayne T., to United States of America, Navy. Wideband sonar energy absorber. 4,628,490, Cl. 367-1.000.

Kramer, Wolfgang: *See*—
Gayer, Herbert; Kramer, Wolfgang; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,628,060, Cl. 514-432.000.

Krasznai, Charles Z.: *See*—
Norwood, Richard L.; Krasznai, Charles Z.; Czernik, Roman; and Haggstrom, Olle E., 4,628,185, Cl. 219-386.000.

Kratzert, Friedrich: *See*—
Dietzell, Hans-Peter; and Kratzert, Friedrich, 4,627,346, Cl. 101-170.000.

Krause, Joachim: *See*—
Eidenschink, Rudolf; Krause, Joachim; Andrews, Beatrice M.; Gray, George W.; and Carr, Neil, 4,627,933, Cl. 252-299.600.

Kreylos, Hans-Albert; and Zeiser, Manfred P., to Ruebeling, Guenter. Method of manufacturing dentures. 4,627,136, Cl. 29-160.600.

Krill, Jerry A.: *See*—
Zinger, William H.; and Krill, Jerry A., 4,628,287, Cl. 333-137.000.

Krohn, Christine E.: *See*—
Thompson, Arthur H.; Katz, Alan J.; and Krohn, Christine E., 4,628,468, Cl. 364-556.000.

Krokaugger, William G., to Mole-Richardson Company. Regulated light dimmer control. 4,628,230, Cl. 315-307.000.

Kruger, Berthold, to Gottfried Bischoff Bau Kompl. Gasreinigungsund Wasserruckkuhlanlagen GmbH & Co. Method of treatment of sludge from a flue gas desulfurization plant. 4,627,970, Cl. 423-555.000.

Krumins, Maigonis V.; and Schindel, Leon H., to United States of America, Navy. Thrust vectoring apparatus for maneuvering missile in flight. 4,627,586, Cl. 244-3.210.

Krupka, Udo: *See*—
Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, 4,628,062, Cl. 514-569.000.

Kruse, Lawrence I.: *See*—
Finkelstein, Joseph A.; Kaiser, Carl; and Kruse, Lawrence I., 4,628,059, Cl. 514-384.000.

Kubon, Achim: *See—*
Voss-Spilker, Peter; Reichelt, Wolfgang; Kubon, Achim; and Keutgen, Franz, 4,628,516, Cl. 373-72.000.

Kubosono, Kenji: *See—*
Nakajima, Takashi; and Kubosono, Kenji, 4,627,960, Cl. 420-472.000.

Kubota, Ltd.: *See—*
Ito, Katsumi, 4,628,454, Cl. 364-424.000.

Kubota, Yuichi: *See—*
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,628,009, Cl. 428-694.000.

Kudo, Koji: *See—*
Shingo, Ichikawa; Nakagawa, Hisahide; Kano, Hayao; and Kudo, Koji, 4,627,739, Cl. 368-282.000.

Kuehnle, Manfred; Cahill, Lysle D.; Butler, John C.; and Bassuk, Lawrence J., to Coulter Systems Corporation. Method and device for reading digital data in an optical mass memory system using electrophotography. 4,628,367, Cl. 358-285.000.

Kuhl, Jane F.: *See—*
Gagen, Paul F.; Kuhl, Jane F.; Mettler, Stephen C.; and Taylor, Carl R., 4,627,942, Cl. 264-1.500.

Kuhle, Engelbert: *See—*
Schwamborn, Michael; Kuhle, Engelbert; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, 4,627,872, Cl. 71-92.000.

Kuhn, Edward S.: *See—*
Bowes, H. David; and Kuhn, Edward S., 4,627,790, Cl. 415-53.00R.

Kuhn, Philip A.; and Osborn, Paul V., to Mobil Oil Corporation. Method and apparatus for feeding a plastic ribbon. 4,627,584, Cl. 242-54.00R.

Kuhnemann, Gunter: *See—*
Dorn, Reimund; Ebner, Heinz; Gundert, Johann; Halder, Ernst; Haspel, Werner; Isert, Ingo; Kuhnemann, Gunter; Lutz, Felix; Seibold, Gerhard; and Wessel, Gerhard, 4,627,687, Cl. 350-96.200.

Kuisma, Heikki T., to Vaisala Oy. Capacitive detector for absolute pressure. 4,628,403, Cl. 361-283.000.

Kumar, Ananda H.: *See—*
Herron, Lester W.; Kumar, Ananda H.; Master, Raj N.; and Nufer, Robert W., 4,627,160, Cl. 29-830.000.

Kuno, Akira: *See—*
Matsui, Kazuma; Hattori, Yoshiyuki; Imani, Yuichi; Kuno, Akira; and Nomura, Yoshihisa, 4,627,671, Cl. 303-116.000.

Kuno, Masashi: *See—*
Tani, Tatsuo; Midorikawa, Akira; Ito, Masaji; Kuno, Masashi; Shinada, Masayuki; Yoshino, Hirobumi; and Nakashima, Yoshihiro, 4,627,707, Cl. 355-14.00R.

Kuntz, Frederick J.; and Schussler, Henry W., to PPG Industries, Inc. Process for concentrating and recovering chloral. 4,628,122, Cl. 568-492.000.

Kunz, Peter, to Mettler Instrumente AG. Weighing apparatus and method for automatically monitoring a constant current source. 4,627,505, Cl. 177-1.000.

Kurakake, Mitsuo; Sakamoto, Keiji; and Kinoshita, Jiro, to Fanuc Ltd. Synchronous motor control system. 4,628,240, Cl. 318-723.000.

Kurata, Masami; Yamamoto, Tadashi; and Ishikawa, Noriyoshi, to Fuji Xerox Co., Ltd. Method for controlling sub-scanning of document reading apparatus. 4,628,368, Cl. 358-293.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Maeda, Yuji; Yamato, Hideyuki; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,628,050, Cl. 514-167.000.

Kuroda, Kazuo, to Pioneer Electronic Corporation. Drop-out compensator for a recorded signal playback system. 4,628,371, Cl. 360-38.100.

Kuroda, Keiichi: *See—*
Shimakata, Masashi; Kawamura, Katsuaki; Tsuchiya, Toshiaki; Shioya, Yuichiro; Inoue, Takao; Syoji, Mitsuo; and Kuroda, Keiichi, 4,628,537, Cl. 455-34.000.

Kuroda, Toru; and Yamawaki, Naokuni, to Asahi Kasei Kogyo Kabushiki Kaisha. Absorbent of autoantibody and immune complexes, adsorbing device and blood purifying apparatus comprising the same. 4,627,915, Cl. 210-195.200.

Kuroyanagi, Masatoshi; Suzuki, Masahiko; Horiuchi, Yasuhiro; Matsui, Kazuma; Moriguchi, Kouichi; and Hashimoto, Yukio, to Nippondenso Co., Ltd. Motor-driven radial plunger pump. 4,627,793, Cl. 417-203.000.

Kurz, Dieter; and Schafer, Norbert, to Carl-Zeiss-Stiftung. Method and arrangement for preventing cathode damage when switching on field emission electron guns. 4,628,226, Cl. 315-102.000.

Kusano, Kazuki: *See—*
Hori, Katsuyoshi; Watanabe, Eiji; Myoga, Toshiharu; Takuwa, Toshiaki; and Kusano, Kazuki, 4,628,182, Cl. 219-130.510.

Kuse, Kazuki, to Yoshida Kogyo K.K. Apparatus for manufacturing slide fastener with separable end stop. 4,627,807, Cl. 425-116.000.

Kusner, Ronald R.: *See—*
Reine, Marion B.; and Kusner, Ronald R., 4,628,203, Cl. 250-334.000.

Kussi, Siegfried: *See—*
Buysch, Hans-Josef; Kussi, Siegfried; and Boehmke, Gunther, 4,627,929, Cl. 252-47.000.

Kusters, Norbert L.; and Herriot, Glen A., to Canadian Patents and Development Limited. Wattmeter. 4,628,257, Cl. 324-142.000.

Kyocera Corporation: *See—*
Mizutani, Michitaka; and Yokoyama, Kiyoshi, 4,628,039, Cl. 501-97.000.
Yokoe, Nobuo; Okawa, Takashi; Fujikawa, Nobuyoshi; and Yamashita, Kazuyoshi, 4,628,404, Cl. 361-321.000.

Kyokuto Sanki Kabushiki Kaisha: *See—*
Koroyasu, Arata, 4,627,653, Cl. 294-8.600.

L A Water Treatment Corporation: *See—*
Meyers, Peter S.; and Alexander, Gerald, 4,627,921, Cl. 210-668.000.

L. Schuler GmbH: *See—*
Mikusch, Gerald; Hubner, Wolfgang; and Munch, Werner, 4,627,528, Cl. 198-621.000.

La-Z-Boy Chair Company: *See—*
LaPointe, Larry P., 4,627,663, Cl. 297-316.000.

Laatt, Richard G.: *See—*
Andrews, Thomas L., Jr.; Fiers, Thomas A.; and Laatt, Richard G., 4,628,379, Cl. 360-77.000.

Labeda, David P.; Goodman, Joseph J.; and Martin, John H. E. J., deceased (by Martin, Mary B., executrix), to American Cyanamid Company. Antibiotic LL-C232018. 4,628,046, Cl. 514-33.000.

Lackner, Joseph L.: *See—*
Feldman, Kieva; Charest, Robert J.; Verville, Gaston; and Lackner, Joseph L., 4,628,011, Cl. 429-49.000.

LAD Technology, Inc.: *See—*
Olson, Donald M., 4,627,963, Cl. 422-125.000.

Laitram Corporation, The: *See—*
Lapeyre, James M., 4,627,200, Cl. 52-191.000.

Lamadrid, Rene: *See—*
Bergemann, David; Figler, Alan A.; Lamadrid, Rene; Pernic, Stanley; and Selman, John J., 4,628,186, Cl. 219-497.000.

Lambright, Arthur J.: *See—*
Goettler, Lloyd A.; and Lambright, Arthur J., 4,627,472, Cl. 138-174.000.

Land, David V., to University of Glasgow, The University Court of the. Microwave thermographic apparatus. 4,627,442, Cl. 128-736.000.

Landa, Benzion; and Rosen, Josef, to Savin Corporation. Multiple color liquid developer electrophotographic copying machine and liquid distribution system therefor. 4,627,705, Cl. 355-4.000.

Langen, Arnold; Benecke, Herta; and Breithaupt, Udo, to Pfeifer & Langen. Unprocessed complete cane sugar and method of producing it. 4,627,880, Cl. 127-43.000.

Langgaard, Gunnar: *See—*
Jensen, Niels D.; and Langgaard, Gunnar, 4,627,792, Cl. 417-83.000.

Lapeyre, James M., to Laitram Corporation, The. Recessed mortise stair. 4,627,200, Cl. 52-191.000.

LaPointe, Larry P., to La-Z-Boy Chair Company. Reclining chair. 4,627,663, Cl. 297-316.000.

Larsen, Lorin V.; and Eidem, Brian L., to Armco Inc. Hydraulic disk brake having a braking torque-to-hydraulic force converter. 4,627,519, Cl. 188-1.110.

Larson, Gordon C. Grain storage and transportation container. 4,627,782, Cl. 414-491.000.

Larson, Lawrence L.: *See—*
Ruger, William B.; and Larson, Lawrence L., 4,627,184, Cl. 42-25.000.

LaRue, Albert D.; Clocker, Roger A.; and Smith, Norman F., Jr., to Babcock & Wilcox Company, The. Primary air exchange for a pulverized coal burner. 4,627,366, Cl. 110-263.000.

LaRue, George S.: *See—*
Smith, Kenneth R.; Johnston, Kent H.; LaRue, George S.; Mueller, Robert A.; and Tabor, Steven A., 4,628,406, Cl. 361-386.000.

Lassen, Frederich O.; Masten, Dianne S.; Schultz, Cheri L.; and Peerenboom, Robert J., to Kimberly-Clark Corporation. Anatomical pad. 4,627,848, Cl. 604-370.000.

Laughlin, Edward N.: *See—*
Cuba, Gary W.; and Laughlin, Edward N., 4,627,163, Cl. 30-95.000.

Laylock, Rick A.; and Theobald, Michael R., to Caterpillar Inc. Countershaft transmission. 4,627,302, Cl. 74-360.000.

LCC.CICE-Compagnie Europeenne de Composants Electroniques: *See—*
Chabrolle, Jacques, 4,628,386, Cl. 360-104.000.

Lear Siegler, Inc.: *See—*
Klein, Thomas A.; and Baker, Peter M., 4,627,364, Cl. 108-147.000.

Learnahan, Harold. Excavating bucket. 4,627,180, Cl. 37-184.000.

LeaRonal, Inc.: *See—*
Nobel, Fred I.; Martin, James L.; and Toben, Michael P., 4,628,165, Cl. 200-268.000.

Lebever Co.: *See—*
Hayhurst, Vondene D., Jr., 4,627,322, Cl. 83-831.000.

Le Blanc, Helmut; Puppe, Lothar; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Process for the preparation of 2-amino-alkylpyridines. 4,628,097, Cl. 546-251.000.

Leckrone, Michael E., to Innoventions Biomedical Inc. Angioplasty catheter and method for use thereof. 4,627,436, Cl. 128-303.100.

Ledak, Paul J.: *See—*
DeHond, Mitchell R.; and Ledak, Paul J., 4,627,152, Cl. 29-571.000.

Ledsham, Paul. Trash bag insert. 4,628,007, Cl. 428-542.800.

Lee, Charles E., to Von Duprin, Inc. Ultrasonic sensing and monitoring systems. 4,628,496, Cl. 367-93.000.

Lee, Ching-Pang, to General Electric Company. Angled turbulence promoter. 4,627,480, Cl. 164-369.000.

Lee, David O.; Montoya, Paul C.; and Wayland, James R., Jr., to United States of America, Energy. Measuring of electrical changes induced by in situ combustion through flow-through electrodes in a laboratory sample of core material. 4,628,267, Cl. 324-376.000.

Lee, Hans. Apparatus for performing suction lipectomy. 4,627,834, Cl. 604-49.000.

Lee, Paul. Concrete foundation pile. 4,627,769, Cl. 405-256.000.

Lee, Robert D., to Thomson Components-Mostok Corporation. Power conserving CMOS reference voltage source. 4,628,250, Cl. 323-317.000.
Leer, Incorporated: *See—*
Collins, John, 4,627,655, Cl. 296-167.000.
Legrand: *See—*
Buard, Yvon, 4,627,469, Cl. 138-92.000.
Leibinsohn, Saul. Device for dispensing a liquid from a collapsible container. 4,627,554, Cl. 222-103.000.
Leland Stanford Junior University, The Board of Trustees of the: *See—*
Jungerman, Roger L.; and Kino, Gordon S., 4,627,730, Cl. 356-349.000.
LeMahieu, Ronald A.: *See—*
Carson, Matthew; LeMahieu, Ronald A.; and Nason, William C., 4,628,115, Cl. 562-464.000.
Leonetti, Fred L.; and Leonetti, Richard L. Contest card having elastomeric coating removal means. 4,627,643, Cl. 283-102.000.
Leonetti, Richard L.: *See—*
Leonetti, Fred L.; and Leonetti, Richard L., 4,627,643, Cl. 283-102.000.
Leplat, Robert, to Brunam Controle Sarl. Remote control locking and unlocking device, especially for an anti-panic bar. 4,627,649, Cl. 292-92.000.
Leroy, Jean; and Ruiz, Pierre, to Framatome & Cie. Process for detecting faults in the power distribution of a pressurized wate: nuclear reactor core and device for making use of this process. 4,627,954, Cl. 376-216.000.
Leroy, Jean; and Ruiz, Pierre, to Framatome & Cie. Process for detecting the variations in the reactivity of the core of a pressurized water nuclear reactor and device for making use of this process. 4,627,955, Cl. 376-216.000.
Les Fils d'Auguste Scheuchzer, S.A.: *See—*
Buhler, Fritz, 4,627,359, Cl. 104-3.000.
Lesso, William G., Jr.: *See—*
Burgess, Trevor M.; and Lesso, William G., Jr., 4,627,276, Cl. 73-151.000.
Lester, J. Harvey, Jr.: *See—*
Beaver, Earl R.; Lester, J. Harvey, Jr.; and Thompson, Thomas J., 4,627,940, Cl. 260-501.110.
Leupers, Hans-Joachim: *See—*
Kindermann, Wolfgang; Kloster, Ernst; Leupers, Hans-Joachim; and Schaper, Helmut, 4,627,235, Cl. 60-415.000.
Leuschner, Horst, to SGS Semiconductor Corporation. Back bias generator. 4,628,214, Cl. 307-296.00R.
Lev, Abraham: *See—*
Campisi, Carl; Lev, Abraham; and Schmid, Richard G., 4,627,157, Cl. 29-741.000.
Lever Brothers Company: *See—*
Butterworth, Robert M.; Martin, John R.; and Willis, Edwin, 4,627,925, Cl. 252-8.800.
Levine, Michael R., to Honeywell Inc. De-icing thermostat for air conditioners. 4,627,245, Cl. 62-157.000.
Levitt, Barrie; and Stolar, Morris, to Taro Pharmaceutical Industries Ltd. Novel oxopyrimidine derivatives, pharmaceutical compositions containing them and their use as anticonvulsant, antianxiety and muscle relaxant agents. 4,628,056, Cl. 514-270.000.
Levitt, George, to Du Pont de Nemours, E. I., and Company. Agricultural sulfonamides. 4,627,873, Cl. 71-93.000.
Lew, Hyok S. Pulsed eddy flow meter. 4,627,294, Cl. 73-861.050.
Lewis, Meirion F., to National Research Development Corporation. Protection of saw devices comprising metallized regions on dielectric substrates. 4,628,222, Cl. 310-313.00R.
Leybold Heraeus GmbH: *See—*
Feuerstein, Albert; Thorn, Gernot; and Ranke, Horst, 4,627,989, Cl. 427-10.000.
LGZ Landis & Gyr Zug AG: *See—*
Halder, Mathis, 4,628,251, Cl. 323-340.000.
Liang, Chi-Dean: *See—*
Rorig, Kurt J.; Djuric, Stevan W.; Fowler, Kerry W.; and Liang, Chi-Dean, 4,628,095, Cl. 546-234.000.
Lieberman, Edgar M. Tracheostomy device. 4,627,433, Cl. 128-207.160.
Liedtke, Kurt: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,627,450, Cl. 131-282.000.
Lien, Wayne W., to RTE Corporation. Full range oil expulsion fuse. 4,628,291, Cl. 337-203.000.
Liepelt, Dirk, deceased (by Liepelt, Joan A., personal representative), to Liepelt & Son, Inc. Cylinder press conversion for hot die application of foil. 4,627,343, Cl. 101-27.000.
Liepelt, Joan A., personal representative: *See—*
Liepelt, Dirk, deceased, 4,627,343, Cl. 101-27.000.
Liepelt & Son, Inc.: *See—*
Liepelt, Dirk, deceased, 4,627,343, Cl. 101-27.000.
Light, Gerard M., to Eaton Corporation. Fluid coupling device with improved fluid cooling. 4,627,523, Cl. 192-58.00B.
Lilja, Launo L.: *See—*
Nyman, Bror G.; Hultholm, Stig-Erik; Lilja, Launo L.; and Makitalo, Valto J., 4,628,391, Cl. 366-265.000.
Lin, John W.; and Dudek, Lesley P., to Xerox Corporation. Silylated compositions, and deuterated hydroxyl squaraine compositions and processes. 4,628,018, Cl. 430-59.000.
Lin, Patrick. Socket wrench with attachable socket storage means in handle. 4,627,315, Cl. 81-177.400.
Lindauer Dornier Gesellschaft mbH: *See—*
Ludwig, Hubertus, 4,627,473, Cl. 139-294.000.
Lindauer, Jerome I.; and Reich, Sharon L., to International Flavors & Fragrances Inc. Single phase clear liquid after-shave treatment product containing aloe vera. 4,627,934, Cl. 252-522.00R.
Linde Aktiengesellschaft: *See—*
Morper, Manfred, 4,627,917, Cl. 210-617.000.
Schmitz-Montz, Hans-Helmut, 4,627,795, Cl. 417-267.000.
von Gemmingen, Ulrich, 4,627,856, Cl. 55-31.000.
Linde, David E.: *See—*
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; Linde, David E.; and Hudson, Bertram J., 4,627,445, Cl. 128-770.000.
Lion Corporation: *See—*
Sakatani, Takenobu; and Suzuki, Shigeru, 4,627,927, Cl. 252-8.750.
Lippert, John A., to National Semiconductor Corporation. Integrated circuit precision capacitor. 4,628,405, Cl. 361-321.000.
Lischke, Burkhard, to Siemens Aktiengesellschaft. Method and apparatus for electrical testing of microwired structures with the assistance of particle probes. 4,628,258, Cl. 324-158.00P.
Liss, Bernard: *See—*
Liss, Saul; and Liss, Bernard, 4,627,438, Cl. 128-419.00R.
Liss, Saul; and Liss, Bernard, to Pain Suppression Labs, Inc. Electronic migraine modulator apparatus and methodology. 4,627,438, Cl. 128-419.00R.
Little, James K. Apparatus for planting seed in seed germinating tray. 4,627,190, Cl. 47-1.00A.
Litton Systems Inc.: *See—*
Loomer, Weston R., 4,627,143, Cl. 29-434.000.
Littwin, Burkhard: *See—*
Geffcken, Walter; Littwin, Burkhard; and Wengert, Rolf, 4,628,228, Cl. 315-169.400.
Liu, Qing-Guo: *See—*
Worrell, Wayne L.; and Liu, Qing-Guo, 4,627,892, Cl. 204-1.00T.
Lo, Chi-Woei. Coded-card type lock device. 4,627,252, Cl. 70-351.000.
Lo, Young S., to A. H. Robins Company, Incorporated. Intermediates for the preparation of aryl substituted pyrido[1,4]benzodiazepines. 4,628,100, Cl. 546-304.000.
Locke, Michael P. Ingredient feeder apparatus. 4,627,555, Cl. 222-200.000.
Lockwood Technical, Inc.: *See—*
Watts, John D., 4,627,345, Cl. 101-119.000.
Loges, Hans J.; and Wilkening, Hermann, to IOG Industrie-Ofenbau Gesellschaft mit beschrankter Haftung. Apparatus for impressing a strip along its edge. 4,627,258, Cl. 72-196.000.
Lomerson, Robert B. Mechanical bonding of surface conductive layers. 4,627,565, Cl. 228-107.000.
Long, Steven M.: *See—*
Skipper, John D.; and Long, Steven M., 4,628,275, Cl. 330-10.000.
Loo, Johnson, to International Computers Limited. Address distribution in data storage apparatus. 4,628,512, Cl. 371-68.000.
Loomer, Weston R., to Litton Systems Inc. Method of forming telescoping shuttle table for mounting at least one sheave thereto. 4,627,143, Cl. 29-434.000.
Loomis, Gary L., to Du Pont de Nemours, E. I., and Company. Thermoplastic elastomeric compositions based on compatible blends of an ethylene copolymer and vinyl or vinylidene halide polymer. 4,627,993, Cl. 428-36.000.
Loozen, Hubert J. J., to Akzo N.V. LHRH antagonists. 4,628,044, Cl. 514-15.000.
Lord, Allen. Decorative neckwear. 4,627,113, Cl. 2-144.000.
Lorenz, Manfred; and Schundehutte, Karl H., to Bayer Aktiengesellschaft. Derivatives of azobarbituric acid or salts or complexes thereof. 4,628,082, Cl. 534-707.000.
Lortie, Richard P.; Vercaemert, Philippe H.; and Gunnell, Douglas L., to R. J. Reynolds Tobacco Company. Moisture eliminator for air washer. 4,627,568, Cl. 236-44.00B.
Loscoe, Claire E., to United States of America, Army. Optical communications systems. 4,628,501, Cl. 370-3.000.
Losinger, Raymond E.: *See—*
Buonomo, Joseph P.; Losinger, Raymond E.; Oliver, Burton L.; and Sucher, Daniel J., 4,628,445, Cl. 364-200.000.
Lou, Perry W., to Texas Instruments Incorporated. Drive circuit for substrate pump. 4,628,215, Cl. 307-297.000.
Love, Mark D.: *See—*
Hafle, Ralph S.; and Love, Mark D., 4,628,298, Cl. 340-347.00P.
Lovell, William E.: *See—*
Balyasny, Marik; Baldwin, Kenneth B.; and Lovell, William E., 4,627,561, Cl. 225-96.000.
LTV Energy Products Company: *See—*
Arlt, Edward J., 4,627,885, Cl. 156-160.000.
Lubrizol Corporation, The: *See—*
Karn, Jack L., 4,627,928, Cl. 252-33.000.
Luc, Penelope J. V., to Luc Technologies Limited. Bonding and bonded products. 4,628,150, Cl. 174-88.00C.
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Luc, Penelope J. V., 4,628,150, Cl. 174-88.00C.
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Borgner, Klaus, 4,627,781, Cl. 414-412.000.
Ludwig, Hubertus, to Lindauer Dornier Gesellschaft mbH. Power loom temple. 4,627,473, Cl. 139-294.000.
Lummus Crest, Inc.: *See—*
Sardina, Helion H., 4,628,136, Cl. 585-441.000.
Lundberg, Robert D.: *See—*
Peiffer, Dennis G.; Lundberg, Robert D.; Sedillo, Lawrence P.; and Newlove, John, 4,627,926, Cl. 252-8.55R.

Lutz, Felix: *See—*
Dorn, Reimund; Ebner, Heinz; Gundert, Johann; Halder, Ernst; Haspel, Werner; Isert, Ingo; Kuhnemann, Gunter; Lutz, Felix; Seibold, Gerhard; and Wessel, Gerhard, 4,627,687, Cl. 350-96.200.

Lynch, Matthew J., to ICI Americas Inc. Dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce plaque accumulation and irritation. 4,627,974, Cl. 424-48.000.

Lynch, Matthew J., to ICI Americas Inc. Dental floss dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce plaque accumulation and irritation. 4,627,975, Cl. 424-49.000.

Lynch, Matthew J., to ICI Americas Inc. Dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce plaque accumulation and irritation. 4,627,976, Cl. 424-49.000.

Lynch, Matthew J., to ICI Americas Inc. Tooth drop dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce plaque accumulation and irritation. 4,627,978, Cl. 424-54.000.

Lynch, Matthew J., to ICI Americas Inc. Toothpaste dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce plaque accumulation and irritation. 4,627,979, Cl. 424-54.000.

Lynch, Matthew J., to ICI Americas Inc. Hard candy dentifrice formulation and method of treating teeth, mouth and throat therewith to reduce irritation and plaque accumulation. 4,627,980, Cl. 424-54.000.

Lynch, Steve J., to Dennison Manufacturing Company. Conveying and grouping of stringed tags. 4,627,220, Cl. 53-414.000.

Lyons, Michael D., to American Standard Inc. Selectable function valve device. 4,627,462, Cl. 137-270.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Breuckmann, Bernd; and Thieme, Werner, 4,627,729, Cl. 356-347.000.

M-O Valve Company Limited, The: *See—*
Cook, Kenneth G., 4,628,398, Cl. 361-120.000.

Maas, Peter: *See—*
Poschmann, Werner; Klenner, Wolfgang; Wattach, Gunter; and Maas, Peter, 4,628,437, Cl. 364-131.000.

Mabilon, Gil: *See—*
Bournonville, Jean-Paul; Candy, Jean-Pierre; and Mabilon, Gil, 4,628,130, Cl. 568-885.000.

Mabuchi, Akira; Uchida, Sadao; and Ishikake, Masanao, to Toyoda Gosei Co., Ltd. Shock absorbing material. 4,627,638, Cl. 280-779.000.

MacArthur, Douglas S.: *See—*
Archer, John R.; Kellaway, Michael J.; and MacArthur, Douglas S., 4,627,255, Cl. 72-10.000.

MacGregor, David C. Cardiovascular prosthetic devices and implants with porous systems. 4,627,836, Cl. 604-93.000.

Mack, Karl E.: *See—*
Schweikert, Otto E.; Reimann, Walter; Wykypiel, Werner; and Mack, Karl E., 4,628,106, Cl. 548-440.000.

Mackal, Glenn. Safety latched automatic actuator and throwable personal flotation assembly. 4,627,823, Cl. 441-95.000.

Mackenzie, Donald: *See—*
Bradley, James; Evans, George E.; Mackenzie, Donald; and Marcuson, Michael, 4,627,821, Cl. 441-83.000.

MacLaughlin, Scott T., to Halliburton Company. Well tool having latching mechanism and method of utilizing the same. 4,627,492, Cl. 166-250.000.

Madza Motor Corporation: *See—*
Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,627,395, Cl. 123-216.000.

Maeda Industries, Ltd.: *See—*
Hosokawa, Mikio, 4,627,305, Cl. 74-489.000.

Maeda, Yuji; Yamato, Hideyuki; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Antinephritic pharmaceutical composition containing 24, 25-dihydroxycholecalciferol as an active ingredient. 4,628,050, Cl. 514-167.000.

Maehara, Shigeharu: *See—*
Hamasaki, Hideaki; Maehara, Shigeharu; and Saita, Shinsuke, 4,627,704, Cl. 355-3.00R.

Maekawa, Yoshikazu: *See—*
Takahashi, Seiji; Miyazaki, Masayuki; Hirabayashi, Tsugio; and Maekawa, Yoshikazu, 4,627,706, Cl. 355-14.0SH.

Maes, Jean Pierre, to S.A. Texaco Belgium N.V. Optical method to study the stability of colloidal systems. 4,628,204, Cl. 250-343.000.

Magami, Masato: *See—*
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,628,336, Cl. 346-209.000.

Magee, William E.; Geister, Michael; and Dillenburg, John N., Jr. Mobile drilling machine. 4,627,499, Cl. 173-43.000.

Magnin, Raymond, to Framatome. Method of constructing a nuclear power station. 4,627,213, Cl. 52-745.000.

Mahaffey, Robert L., Jr.: *See—*
Moore, Patrick D.; and Mahaffey, Robert L., Jr., 4,627,939, Cl. 260-404.000.

Mahnig, Fritz; and Schulte, Gunter, to Georg Fischer AG. Vehicle suspension assembly. 4,627,667, Cl. 301-126.000.

Maki, Yoshitaka: *See—*
Nohara, Akira; and Maki, Yoshitaka, 4,628,098, Cl. 546-271.000.

Makita, Tsuyoshi: *See—*
Saga, Toshihiko; Makita, Tsuyoshi; Hirono, Hisao; and Inao, Akitaka, 4,627,990, Cl. 427-10.000.

Makitalo, Valto J.: *See—*
Nyman, Bror G.; Hultholm, Stig-Erik; Lilja, Launo L.; and Makitalo, Valto J., 4,628,391, Cl. 366-265.000.

Malik, Arshad H., to A. E. Staley Manufacturing Company. Method and compositions for hard surface cleaning. 4,627,931, Cl. 252-153.000.

Manago, Iwami: *See—*
Ono, Izumi; Manago, Iwami; Takayama, Haruo; and Takahashi, Yasuo, 4,627,677, Cl. 339-17.00M.

Mancabelli, Robert C., to Carrier Corporation. Tube extracting apparatus. 4,627,155, Cl. 29-726.000.

Manduley, Flavio M., to Pitney Bowes Inc. Postal rate memory module with integral battery power. 4,628,457, Cl. 364-464.000.

Mannesmann Aktiengesellschaft: *See—*
Voss-Spilker, Peter; Reichelt, Wolfgang; Kubon, Achim; and Keutgen, Franz, 4,628,516, Cl. 373-72.000.

Mannesmann Rexroth GmbH: *See—*
Wusthof, Peter; Schneider, Johann; and Schulz, Ewald, 4,627,801, Cl. 418-61.00B.

Manness, Cecil E.; and Nolette, Leo J. Fill gate for grain bins and the like. 4,627,378, Cl. 116-229.000.

Manusch, Christoph; and Scholz, Gunter, to Pelikan Aktiengesellschaft. Writing instrument with sig naling cap. 4,627,757, Cl. 401-194.000.

Maples, Stephen S., to Acer Automation. Gage position control. 4,627,168, Cl. 33-169.00R.

Marathon Oil Company: *See—*
Christiansen, Richard L.; and Kim, Hiemi, 4,627,273, Cl. 73-61.10R.
Jones, Stanley C., 4,627,270, Cl. 73-38.000.

Marbach, Karl G., to Karl G. Marbach GmbH & Co. Apparatus for severing foamed material. 4,627,580, Cl. 241-101.400.

Marchand, Gilles: *See—*
Desmons, Gerard; and Marchand, Gilles, 4,628,342, Cl. 358-10.000.

Marchetti, Germano: *See—*
Casagrande, Cesare; Ghirardi, Paolo; Goldberg, Leon I.; and Marchetti, Germano, 4,628,064, Cl. 514-654.000.

Marcuson, Michael: *See—*
Bradley, James; Evans, George E.; Mackenzie, Donald; and Marcuson, Michael, 4,627,821, Cl. 441-83.000.

Mares, Frank; Tang, Reginald T-H.; Galle, James E.; and Federici, Rose M., to Allied Corporation. Use of silica catalyst for selective production of lactams. 4,628,085, Cl. 540-539.000.

Mark, Carol M., Ester H. Mark, legal representatives: *See—*
Mark, Victor, deceased; and Peters, Edward N., 4,628,081, Cl. 528-176.000.

Mark, Victor, deceased (by Mark, Carol M., Ester H. Mark, legal representatives); and Peters, Edward N., to General Electric Company. Polycarbonate exhibiting improved impact properties. 4,628,081, Cl. 528-176.000.

Markham, Vivian C. Belt clasp. 4,627,132, Cl. 24-169.000.

Marko, Paul D.; Kneisel, Thomas F.; and Garay, Oscar M., to Motorola, Inc. Low profile antenna on non-conductive substrate. 4,628,322, Cl. 343-702.000.

Markovics, Margaret, to ACT Laboratories. Album with foldable sheets. 4,627,640, Cl. 281-5.000.

Marley, Robert R.: *See—*
Birrittella, Mark S.; Marley, Robert R.; and Nootbaar, Keith D., 4,628,248, Cl. 323-314.000.

Marquet, Maurice C. Multi-purpose marine barrier system. 4,627,766, Cl. 405-195.000.

Marquip, Inc.: *See—*
Anderson, Leland J.; Jourdan, James K.; and Marschke, Carl R., 4,627,214, Cl. 83-71.000.

Mars, Inc.: *See—*
Dobbins, Bob M.; and Barnes, Elwood E., 4,628,194, Cl. 235-379.000.

Marschke, Carl R.: *See—*
Anderson, Leland J.; Jourdan, James K.; and Marschke, Carl R., 4,627,214, Cl. 83-71.000.

Marshall, Andrew C. Aeroelastically responsive composite propeller. 4,627,791, Cl. 416-132.00R.

Marshall, J. Nathaniel, to Honeywell Information Systems Inc. Method for changing the resolution of compressed image data. 4,628,534, Cl. 382-41.000.

Martin, Eric A., to Medtronic, Inc. B medical monitoring circuit. 4,627,441, Cl. 128-696.000.

Martin, Eugene J., to Pneumo Corporation. Pilot operated directional control valve. 4,627,467, Cl. 137-625.600.

Martin, Gayle P., to Harris Corporation. Aperture transformation sidelobe canceller. 4,628,321, Cl. 342-379.000.

Martin, James L.: *See—*
Nobel, Fred I.; Martin, James L.; and Toben, Michael P., 4,628,165, Cl. 200-268.000.

Martin, John H. E. J., deceased: *See—*
Labeda, David P.; Goodman, Joseph J.; and Martin, John H. E. J., deceased, 4,628,046, Cl. 514-33.000.

Martin, John R.: *See—*
Butterworth, Robert M.; Martin, John R.; and Willis, Edwin, 4,627,925, Cl. 252-8.800.

Martin, Mary B., executrix: *See—*
Labeda, David P.; Goodman, Joseph J.; and Martin, John H. E. J., deceased, 4,628,046, Cl. 514-33.000.

Martin, Raymond G.: *See—*
Gehman, Roland P.; and Martin, Raymond G., 4,627,633, Cl. 280-432.000.

Martino, William L., Jr.: *See—*
Yu, Ruey J.; and Martino, William L., Jr., 4,628,253, Cl. 324-73.00R.

Martinot, Bernard: *See*—
Grasset, Daniel; and Martinot, Bernard, 4,627,962, Cl. 422-40.000.
Maruyama, Teruo: *See*—
Otsuki, Toshinori; and Maruyama, Teruo, 4,627,291, Cl. 73-634.000.
Marvakov, Ivan K.; and Russev, Todor Y., to ZNIKA. D.C. impulse arc welder employing thyristors. 4,628,427, Cl. 363-27.000.
Marx, Werner, to Wickmann Werke GmbH. Sub-miniature fuse. 4,628,293, Cl. 337-216.000.
Marzik, James V.: *See*—
Suplinskas, Raymond J.; Henze, Thomas W.; and Marzik, James V., 4,628,002, Cl. 428-367.000.
Maschinenfabrik Walter Scheele GmbH & Co. KG: *See*—
Renders, Klaus-Helmut, 4,627,328, Cl. 91-410.000.
Masciarelli, Camillo. Conveyor system with rollers and plungers. 4,627,526, Cl. 193-35.00A.
Mashiba, Akihiro; Hagita, Kazuteru; Miyazawa, Yoshinobu; Saino, Tetsushi; and Tashiro, Yasuhisa, to Nippon Kayaku Kabushiki Kaisha. N-benzyloxycarbonyl-L-threonine amide hemihydrate. 4,628,111, Cl. 560-159.000.
Masten, Dianne S.: *See*—
Lassen, Frederich O.; Masten, Dianne S.; Schultz, Cheri L.; and Peerenboom, Robert J., 4,627,848, Cl. 604-370.000.
Master, Raj N.: *See*—
Herron, Lester W.; Kumar, Ananda H.; Master, Raj N.; and Nufer, Robert W., 4,627,160, Cl. 29-830.000.
Mastner, Georg, to BBC Brown, Boveri & Company, Limited. Switching power-supply unit with improved start-up behavior. 4,628,430, Cl. 363-25.000.
Masuda, Shigeru: *See*—
Mori, Teijiro; Wada, Yuichi; Kakizoe, Masahiro; Masuda, Shigeru; and Nishizako, Shizutaka, 4,628,163, Cl. 200-144.00R.
Masuoka, Fujio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of producing a semiconductor memory device. 4,627,153, Cl. 29-571.000.
Mathamel, Flavius A., to Burroughs Corporation. Electromagnetic interference suppresion for electrical discharge printers. 4,628,325, Cl. 346-1.100.
Mathiesen, Mait M.; and Svensson, Kent O., to AB Carbogel; and Berol Kemi AB, a part interest. Method of preparing an aqueous slurry of solid carbonaceous fuel particles and an aqueous slurry so prepared. 4,627,855, Cl. 44-51.000.
Matsubara, Naoki; Numata, Hideo; and Ogawa, Yutaka, to Oval Engineering Co., Ltd. Vortex flow meter. 4,627,295, Cl. 73-861.240.
Matsubara, Takehiro, to Mitsubishi Denki Kabushiki Kaisha. Test device for testing an actuator circuit. 4,628,268, Cl. 324-418.000.
Matsubayashi, Shinji; Kiyota, Satoru; and Hosoya, Eiji, to Honda Giken Kogyo Kabushiki Kaisha. Front brake apparatus in motorized three-wheeled vehicle. 4,627,520, Cl. 188-18.00R.
Matsuda, Ikuo: *See*—
Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,627,395, Cl. 123-216.000.
Matsuda, Shohei; and Sato, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic braking pressure control apparatus for vehicles. 4,627,670, Cl. 303-115.000.
Matsudaira, Yasuyuki; and Hiraga, Masaharu, to Sanden Corporation. Scroll type fluid displacement compressor with spiral wrap elements of varying thickness. 4,627,800, Cl. 418-55.000.
Matsui, Hirotoshi, to Sharp Kabushiki Kaisha. Daisy-wheel type printing system with multiple functions. 4,627,753, Cl. 400-174.000.
Matsui, Kazuma; Hattori, Yoshiyuki; Imani, Yuichi; Kuno, Akira; and Nomura, Yoshihisa, to Nippondenso Co., Ltd.; and Toyota Jodosha Kabushiki Kaisha. Antiskid control device. 4,627,671, Cl. 303-116.000.
Matsui, Kazuma: *See*—
Kuroyanagi, Masatoshi; Suzuki, Masahiko; Horiuchi, Yasuhiro; Matsui, Kazuma; Moriguchi, Kouichi; and Hashimoto, Yukio, 4,627,793, Cl. 417-203.000.
Matsui, Masao; Naito, Hiroshi; and Osagawa, Takao, to Kanebo, Ltd.; and Kanebo Synthetic Fibers, Ltd. Method of producing abrasive fibers. 4,627,950, Cl. 264-103.000.
Matsumoto, Haruyuki, to Canon Kabushiki Kaisha. Ink printhead with holder mount. 4,628,332, Cl. 346-140.00R.
Matsumoto, Mamoru: *See*—
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,628,057, Cl. 514-292.000.
Matsumura, Osamu. Fuel injection apparatus. 4,627,403, Cl. 123-447.000.
Matsuoka, Yuzo: *See*—
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,628,057, Cl. 514-292.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kagomoto, Yoshiteru, 4,627,409, Cl. 126-21.00A.
Kamo, Tetuo; Miyagawa, Junichi; Okada, Kazuichi; and Shiota, Eiji, 4,627,415, Cl. 126-299.00R.
Mori, Takashi; Mizu, Kouichi; and Jo, Yasunori, 4,627,316, Cl. 81-430.000.
Otsuki, Toshinori; and Maruyama, Teruo, 4,627,291, Cl. 73-634.000.
Matsushita Graphic Communications Systems, Inc.: *See*—
Mizutani, Mikio, 4,628,276, Cl. 330-86.000.
Matsushita, Toshihiko: *See*—
Sekine, Mikiya; Matsushita, Toshihiko; Morishita, Sadao; and Oiri, Yasuhiko, 4,628,337, Cl. 346-217.000.
Matsuyama, Yukio: *See*—
Okamoto, Keiichi; Nakahata, Kozo; Matsuyama, Yukio; Doi, Hideaki; Aiuchi, Susumu; and Nomoto, Mineo, 4,628,531, Cl. 382-8.000.
Mattei, Riccardo; and Neri, Armando, to G.D. Societa per Azioni. Device for supplying webs of wrapping material to a cigarette making machine of the two rod type. 4,627,319, Cl. 83-73.000.
Mattson, Walter E.: *See*—
Gilman, Paul S.; and Mattson, Walter E., 4,627,959, Cl. 419-61.000.
Matuyama, Takesi: *See*—
Saito, Kimitaka; Iwamoto, Kenzi; Egami, Tsuneyuki; Saito, Tsutomu; and Matuyama, Takesi, 4,627,402, Cl. 123-440.000.
Maudsley, Andrew A., to Advanced NMR Systems, Inc. Multiple echo chemical shift imaging. 4,628,262, Cl. 324-309.000.
Mayr, Albert; and Stickel, Oskar, to Hydromatik GmbH. Output control apparatus for a hydrostatic drive with delivery adjustment. 4,627,238, Cl. 60-452.000.
Mazda Motor Corporation: *See*—
Asanomi, Koji; and Abe, Ryoji, 4,627,394, Cl. 123-195.00R.
Gokimoto, Hiroyuki; and Kiyomitsu, Isao, 4,627,656, Cl. 296-65.00R.
Mitoh, Syunji, 4,627,158, Cl. 29-771.000.
Yokooku, Katsuhiko; Seo, Nobuhide; Oda, Hiroyuki; Sumida, Shizuo; and Yatomi, Satoshi, 4,627,311, Cl. 74-866.000.
Mazumder, Nikhil C., to Advanced Micro Devices, Inc. Merging of logic function circuits to ECL latch or flip-flop circuit. 4,628,216, Cl. 307-455.000.
McAdams, Hirimie T.: *See*—
Hahn, William F.; McAdams, Hirimie T.; and Talley, Robert L., 4,627,576, Cl. 241-24.000.
McArthur, David T., deceased (by Guilliams, Donald E., executor), to Safford, Beverly. Water activated electric cell and survival lamp system. 4,628,420, Cl. 362-208.000.
McClung, James A.: *See*—
Bulso, Joseph D., Jr.; and McClung, James A., 4,627,265, Cl. 72-354.000.
McConnell, William P., to Westinghouse Electric Corp. Robotic system for mounting electrical components. 4,628,464, Cl. 364-513.000.
McCoy, Wilbur L.: *See*—
Reighard, Robert P.; McCoy, Wilbur L.; and Gobeille, William P., 4,628,310, Cl. 340-825.720.
McCutchan, Diane R.; Roeding, Gretchen W.; and Kibby, Gordon R., to McCutchan, Diane R. Airplane seat with convertible flotation-cushion system. 4,627,587, Cl. 244-122.00R.
McElhaney, William G., to Coilco, Inc. Tube spin close apparatus. 4,627,257, Cl. 72-102.000.
McElroy, Benedict R., to Action Products, Inc. Shock absorbing insole construction. 4,627,179, Cl. 36-44.000.
McFarland, John. Musical faucet. 4,627,326, Cl. 84-94.00C.
McKagen, Ollie H. Cycle suspension system. 4,627,632, Cl. 280-276.000.
McKay, William R.: *See*—
Dickens, Jonathan P.; and McKay, William R., 4,628,104, Cl. 548-341.000.
McKechnie, Ronald M. K., to Vaal Reefs Exploration and Mining Co. Shaft guide alignment measurement. 4,627,170, Cl. 33-181.00R.
McKeough, David T.: *See*—
Chang, Wen-Hsuan; and McKeough, David T., 4,628,076, Cl. 525-440.000.
McKinnie, Bonnie G.; and Mitchell, Olan W., to Ethyl Corporation. Tetrabromobisphenol-A process. 4,628,124, Cl. 568-726.000.
McMinn, William D. Washer cutter. 4,627,166, Cl. 30-277.000.
McVay, William P.: *See*—
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Medero, Richard: *See*—
Ramsey, Maynard, III; Muskatello, James M.; Hood, Rush W., Jr.; Medero, Richard; and Stephenson, Stanley K., 4,627,440, Cl. 128-682.000.
Medtronic, Inc.: *See*—
Martin, Eric A., 4,627,441, Cl. 128-696.000.
Megadiamond Industries, Inc.: *See*—
Horton, M. Dave, 4,627,503, Cl. 175-329.000.
Meguerdichian, Gary M.; and Hovey, Isabel B., to Otis Elevator Company. Backup position signaling in an elevator. 4,627,518, Cl. 187-29.00R.
Mei San Co., Ltd.: *See*—
Tahara, Yoshinori, 4,627,380, Cl. 118-77.000.
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Nawata, Takanari; Sakaguchi, Shuzabu; and Aoki, Osamu, 4,628,119, Cl. 564-314.000.
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Mitsuboshi Belting Ltd.: *See—*
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Alameddine, Bassem R., 4,627,493, Cl. 166-263.000.
Audeh, Costandi A., 4,627,964, Cl. 423-228.000.
Chen, Nai Y.; and Degnan, Thomas F., Jr., 4,627,911, Cl. 208-120.000.
Chu, Chin-Chiun, 4,628,137, Cl. 585-445.000.
Gould, Ronald M.; and Tabak, Samuel A., 4,628,134, Cl. 585-331.000.
Green, Gary J.; and Schwartz, Albert B., 4,628,040, Cl. 502-9.000.
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Krokaugger, William G., 4,628,230, Cl. 315-307.000.
Molecular Engineering Associates, Ltd.: *See*—
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Moller, Rudolf: *See*—
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Ternstrom, Maj L., 4,627,846, Cl. 604-349.000.
Momin, Salim A., to Chrysler Motors Corporation. Temperature compensation circuit and method for position sensors. 4,628,316, Cl. 340-870.380.
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Huggins, Orville C., 4,627,347, Cl. 101-292.000.
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Beaver, Earl R.; Lester, J. Harvey, Jr.; and Thompson, Thomas J., 4,627,940, Cl. 260-501.110.
Fisher, W. Keith, 4,628,073, Cl. 525-70.000.
Schumacher, Ignatius, 4,628,131, Cl. 568-937.000.
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Goettler, Lloyd A.; and Lambright, Arthur J., 4,627,472, Cl. 138-174.000.
Montague, Herbert R., to Control Concepts Corporation. Power converter apparatus and method employing plural branches. 4,628,438, Cl. 363-134.000.
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Camaggi, Giovanni; Gozzo, Franco; Signorini, Ernesto; and Palla, Ottorino, 4,628,101, Cl. 548-200.000.
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Montoya, Paul C.: *See*—
Lee, David O.; Montoya, Paul C.; and Wayland, James R., Jr., 4,628,267, Cl. 324-376.000.
Montpetit, Jean, to Uroplast Inc. Pipe saddle joint and assembly. 4,627,648, Cl. 285-197.000.
Mook, Adrianus; and Geluk, Ronald J., to N.V. Optische Industrie "De Oude Delft" . Method and apparatus for determining the image transfer quality of an imaging system. 4,628,360, Cl. 358-139.000.
Mookherjee, Braja D.: *See*—
Kiwala, Jacob; Mookherjee, Braja D.; and Trenkle, Robert W., 4,627,449, Cl. 131-276.000.
Moon, Philip A. K.: *See*—
Chadwick, Peter E.; Moon, Philip A. K.; and Thompson, Norman C., 4,628,518, Cl. 375-88.000.
Moore, Boyd B. Well bore barrier penetrator arrangement and method for multiple conductor pump power cable. 4,627,490, Cl. 166-65.100.
Moore, Gary R. Air removing apparatus. 4,627,796, Cl. 417-313.000.
Moore, Harry V.: *See*—
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Moore, Kenneth P., to Xerox Corporation. Bottom sheet feeding apparatus employing a combination slide plate and vacuum valve. 4,627,606, Cl. 271-98.000.
Moore, Patrick D.; and Mahaffey, Robert L., Jr., to Milliken Research Corporation. P-formyl-N,N-dipolyoxyalkylenesubstitutedaniline. 4,627,939, Cl. 260-404.000.
Moore, Scott B. Punch press machine including a workpiece positioning means with a quick change die holder, punch and stripper unit. 4,627,321, Cl. 83-468.000.
Moran, Michael J., to USM Corporation. Method for taking tare weights in automatic combination weighing machines. 4,627,504, Cl. 177-1.000.
Moran, Robert P.; and Carhart, Edward P., Jr., to Charles of the Ritz Group Ltd. Skin mousse. 4,627,973, Cl. 424-47.000.
Morell, Josef; and Schmidt, Harald, to Steyr-Daimler-Puch AG. Fuel injection unit for each cylinder of a diesel engine. 4,627,570, Cl. 239-90.000.
Morgado, Eugenio J.: *See*—
Brady, William A., Jr.; Jordan, Stanley R.; Morgado, Eugenio J.; Perlini, Julius J.; and Stricker, Alfred A., 4,627,829, Cl. 493-189.000.
Morgan, Lee W., to S. C. Johnson & Son, Inc. Emulsion copolymerization process. 4,628,071, Cl. 524-832.000.
Morgan, Paul W.; and Amlani, Kish, to Eaton Corporation. Shunt calibration system for a transducer mounted on a rotating member. 4,627,296, Cl. 73-862.330.
Mori, Takashi; Mizu, Kouichi; and Jo, Yasunori, to Matsushita Electric Industrial Co., Ltd. Automatic screwdriver. 4,627,316, Cl. 81-430.000.
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Mori, Teijiro; Wada, Yuichi; Kakizoe, Masahiro; Masuda, Shigeru; and Nishizako, Shizutaka, to Mitsubishi Denki Kabushiki Kaisha. Power switch. 4,628,163, Cl. 200-144.00R.
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Morris, John C., to Staefa Control System Inc. Four function pneumatic controller. 4,627,569, Cl. 236-49.000.
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Morse, Robert L., to Tecumseh Products Company. Suction accumulator. 4,627,247, Cl. 62-503.000.
Mortensen, Harold R., Sr., to Facet Enterprises, Inc. Engine starter gearing. 4,627,299, Cl. 74-7.00A.
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Crabtree, Larry V., 4,627,946, Cl. 264-51.000.
Morwing, Bo A.; Andersson, Bengt L.; and Gustavsson, Per-Olof G., to Telefonaktiebolaget L M Ericsson. Navigation system. 4,628,319, Cl. 342-46.000.
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Nakamura, Kazuo; Jyojiki, Masao; and Aoki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Focus detecting and indicating device for camera. 4,627,700, Cl. 354-409.000.
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Vodinh, Hien; and Pooler, Robert E., 4,628,237, Cl. 318-626.000.
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Narda Microwave Corporation, The: *See*—
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Naser, Joachim; Schmid, Olaf; Schmidt, Gerhard; Sturm, Theodor; and Walter, Berthold, to Robert Bosch GmbH. Electromagnetic relay with zig-zag armature spring. 4,628,290, Cl. 335-274.000.
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Sharkey, Hubert J., 4,628,117, Cl. 562-577.000.
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Nazmy, Mohamed; and Singer, Robert, to BBC Brown, Boveri & Company Limited. Method for the application of a corrosion-protection layer containing protective-oxide-forming elements to the base body of a gas turbine blade and corrosion-protection layer on the base body of a gas turbine blade. 4,627,896, Cl. 204-37.100.
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Speraw, Floyd G., 4,628,413, Cl. 361-415.000.
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Neasham, David L., to Thorn Emi Automation Limited. Electrical indicating circuit. 4,628,244, Cl. 320-48.000.
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Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, to Bayer Aktiengesellschaft. Red nickel azine pigment. 4,628,093, Cl. 546-6.000.
Nelson, David A., to Comlinear Corporation. Wideband feedback amplifier. 4,628,279, Cl. 330-257.000.
Nelson, David E.; Berg, David M.; and Hannon, Robert J., to Hydroacoustics Inc. Sensor system with time division multiplexing telemetry. 4,628,493, Cl. 367-79.000.
Nelson, Raymond J. One level sorting network. 4,628,483, Cl. 364-900.000.
Nelson, Richard V.; and Stephen, John F., to ICI Americas Inc. Preparation of 2-halo-5-methylpyridines from 4-methyl-4-pentene derivatives. 4,628,096, Cl. 546-250.000.
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De Coene, Frans J. G. C., 4,627,226, Cl. 56-14.600.
Glass, Emmett F.; and Wagstaff, Robert A., 4,627,340, Cl. 100-5.000.
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NGK Insulators, Ltd.: *See*—
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Nguyen, Tuan A.; Sosinski, Ronald T.; and Buchar, Wayne A., to Xerox Corporation. Automatic scanning optics alignment. 4,627,721, Cl. 355-77.000.
Nicely, Charles W., to United Steel & Wire Company. Compression sleeve corner structure for adjustable shelving. 4,627,543, Cl. 211-187.000.
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Bianchi, John E.; Miller, Martin R.; and Nichols, Richard D. E., 4,627,558, Cl. 224-238.000.
Nichols, Thomas K. Cleaning device for hook and loop fasteners. 4,627,126, Cl. 15-105.000.
Nickola, Richard A.; and Sok, Brian A., to Inland Steel Company. Powder metal and/or refractory coated ferrous metal. 4,628,004, Cl. 428-413.000.
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Dietzell, Hans-Peter; and Kratzert, Friedrich, 4,627,346, Cl. 101-170.000.
Niedrach, Leonard W.; and Will, Fritz G., to General Electric Company. Long life portable oxygen sensor with high stability. 4,627,907, Cl. 204-415.000.
Niemanns, Gerd, to Draftex Industries Limited. Window glass mounting arrangements. 4,627,145, Cl. 29-450.000.
Nigorikawa, Shigeru, to Alps Electric Co., Ltd. Case for shielding electronic devices. 4,628,412, Cl. 361-424.000.
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Nippon Kayaku Kabushiki Kaisha: *See*—
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Nippon Kogaku K. K.: *See*—
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Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, 4,627,279, Cl. 73-195.000.
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Kawano, Tsuyoshi; Sanagi, Shiroh; and Nakajima, Koe, 4,627,881, Cl. 148-12.00C.

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Kato, Masaaki; Nakatsuka, Hirotaka; Tojo, Shigeki; and Arai, Kazuyoshi, 4,627,571, Cl. 239-90.000.
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Nishida, Katsuhiko; Naruse, Tokio; and Shibata, Hiroshi, to Tsuchiya Co., Ltd. Fuel level detector for automobile fuel tank. 4,627,283, Cl. 73-313.000.

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Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, to TDK Corporation. Magnetic recording medium. 4,628,009, Cl. 428-694.000.

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Nishimune, Hisaaki; Ichimura, Yoshikuni; and Hata, Kentaro, to Kawasaki Jukogyo Kabushiki Kaisha. Hydraulic circuit arrangement. 4,627,239, Cl. 60-484.000.

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Nishio, Takashi; and Ikeya, Tomoyoshi, to Pioneer Electronic Corporation. Optical axis monitoring system. 4,627,725, Cl. 356-152.000.

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Nissl, Norbert, to Messerschmitt-Bolkow-Blohm GmbH. Resistance welding equipment having an optical accelerometer for measuring electrode acceleration. 4,628,175, Cl. 219-110.000.

Nitsch, Wilhelm; Treiber, Helmut; and Benker, Gerhard, to Agfa-Gevaert Aktiengesellschaft. Method and apparatus for reproducing the images of film frames. 4,627,719, Cl. 355-41.000.

Nitta, Yoshio: *See*—
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Nobel, Fred I.; Martin, James L.; and Toben, Michael P., to LeaRonal, Inc. Electrical contacts and methods of making contacts by electrodeposition. 4,628,165, Cl. 200-268.000.

Noguchi, Takaharu: *See*—
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Nolette, Leo J.: *See*—
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Nomoto, Mineo: *See*—
Okamoto, Keiichi; Nakahata, Kozo; Matsuyama, Yukio; Doi, Hideaki; Aiuchi, Susumu; and Nomoto, Mineo, 4,628,531, Cl. 382-8.000.

Nomura, Akihiro: *See*—
Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; Toriumi, Mototada; and Nishino, Fumio, 4,627,701, Cl. 355-3.0CH.

Nomura, Yoshihisa: *See*—
Matsui, Kazuma; Hattori, Yoshiyuki; Imani, Yuichi; Kuno, Akira; and Nomura, Yoshihisa, 4,627,671, Cl. 303-116.000.

Nootbaar, Keith D.: *See*—
Birrittella, Mark S.; Marley, Robert R.; and Nootbaar, Keith D., 4,628,248, Cl. 323-314.000.

Nordson Corporation: *See*—
Kolibas, James A.; and Mueller, William P., 4,627,465, Cl. 137-563.000.

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Collins, Floyd K.; and Say, Donald L., 4,628,224, Cl. 313-414.000.

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Bruning, Gert W.; and Fellows, Mark W., 4,628,284, Cl. 331-86.000.

Norwood, Richard L.; Krasznai, Charles Z.; Czernik, Roman; and Haggstrom, Olle E., to Black & Decker, Inc. Toaster oven and protective hood. 4,628,185, Cl. 219-386.000.

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Nozaki, Hiromi, to Konishiroku Photo Industry Co., Ltd. Recording apparatus with controlled power source for heat fusing device. 4,627,714, Cl. 355-14.0FU.

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Nufer, Robert W.: *See*—
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Nuita, Akira: *See*—
Yagi, Norio; and Nuita, Akira, 4,627,752, Cl. 400-144.200.

Nukem GmbH: *See*—
Huschelrath, Gerhard; and Ruth, Ursula, 4,628,261, Cl. 324-240.000.

Numata, Hideo: *See*—
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Nurkowski, Paul S. Progressive weight resistance weightlifting mechanism. 4,627,615, Cl. 272-118.000.

Nuvatec, Inc.: *See*—
Huber, William B., 4,628,289, Cl. 335-168.000.

N.V. Bekaert S.A.: *See*—
Bourgois, Luc, 4,627,229, Cl. 57-213.000.

N.V. Optische Industrie "De Oude Delft" : *See*—
Mook, Adrianus; and Geluk, Ronald J., 4,628,360, Cl. 358-139.000.

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Kopp, Raun A., 4,627,551, Cl. 222-1.000.

O'Brien, Gerald E.: *See*—
Sturrock, Peter E.; and O'Brien, Gerald E., 4,628,463, Cl. 364-497.000.

Occidental Petroleum Corporation: *See*—
Prasad, Rama R. S., 4,627,458, Cl. 137-13.000.

Ochiai, Chiaki: *See*—
Furuta, Youichi; and Ochiai, Chiaki, 4,627,332, Cl. 92-168.000.

Oda, Hiroyuki: *See*—
Yokooku, Katsuhiko; Seo, Nobuhide; Oda, Hiroyuki; Sumida, Shizuo; and Yatomi, Satoshi, 4,627,311, Cl. 74-866.000.

Oda, Satoshi: *See*—
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,628,336, Cl. 346-209.000.

Odam, Kenneth D.: *See*—
Sager, John C.; Odam, Kenneth D.; Boyd, Robert T.; and Dell, Peter W., 4,628,508, Cl. 371-9.000.

Odenwalder Kunststoffwerke GmbH: *See*—
Dorsam, Karl-Heinz, 4,627,916, Cl. 210-488.000.

Oediger, Hermann: *See*—
Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, 4,628,062, Cl. 514-569.000.

Oels, Udo: *See*—
Dhein, Rolf; Meier, Helmut M.; Meissner, Hans J.; Kircher, Klaus; and Oels, Udo, 4,627,949, Cl. 264-101.000.

Ofcina de Investigacion Agrupada, S.A.: *See*—
Bastida, Tomas, 4,627,181, Cl. 38-77.700.

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Takematsu, Tetsuo; Kikkawa, Nobuyuki; and Ogawa, Hideaki, 4,627,874, Cl. 71-118.000.

Ogawa, Hiroshi: *See*—
Iwahara, Makoto; and Ogawa, Hiroshi, 4,628,525, Cl. 381-26.000.

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Matsubara, Naoki; Numata, Hideo; and Ogawa, Yutaka, 4,627,295, Cl. 73-861.240.

Ogle, William D., to Cooper Industries, Inc. Twist on reflector for industrial light fixture. 4,628,423, Cl. 362-341.000.

Oguey, Henri J.: *See*—
Vittoz, Eric A.; and Oguey, Henri J., 4,628,274, Cl. 330-9.000.

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O'Hagan, Michael A.; and Smith, Richard D., to Garrett Corporation, The. Fluid bed hog fuel dryer. 4,627,173, Cl. 34-10.000.

Ohishi, Hirotoshi: *See*—
Fujihisa, Hiroaki; Ohishi, Hirotoshi; Fujii, Hiroshi; and Kobayashi, Yoshiaki, 4,628,288, Cl. 335-166.000.

Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, to Nippon Soken, Inc. Direct-heated gas-flow measuring apparatus. 4,627,279, Cl. 73-195.000.

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Sekine, Mikiya; Matsushita, Toshihiko; Morishita, Sadao; and Oiri, Yasuhiko, 4,628,337, Cl. 346-217.000.

Oka, Tateki, to Minolta Camera Kabushiki Kaisha. Toner handling apparatus for electro-photographic copying machines. 4,627,716, Cl. 355-15.000.

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Okabe, Takahiro; and Mizuno, Masashi, to Educational Foundation Daido Gakuen; and Daido Tokushuko Kabushiki Kaisha. Measuring temperature of a heated metal. 4,627,743, Cl. 374-122.000.

Okada, Kazuichi: *See*—
Kamo, Tetuo; Miyagawa, Junichi; Okada, Kazuichi; and Shiota, Eiji, 4,627,415, Cl. 126-299.00R.

Okada, Takashi; and Mogi, Takao, to Sony Corporation. Memory selecting system for scrambled television receiver. 4,628,359, Cl. 358-122.000.

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Holiman, William E.; and O'Keefe, Henry, 4,627,581, Cl. 241-167.000.

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Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,627,395, Cl. 123-216.000.

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Aughton, John E.; and Oldershaw, Robert J., 4,628,350, Cl. 358-75.000.

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Buonomo, Joseph P.; Losinger, Raymond E.; Oliver, Burton L.; and Sucher, Daniel J., 4,628,445, Cl. 364-200.000.

Oliver, Leland W.: *See*—
Goodman, David S.; and Oliver, Leland W., 4,628,410, Cl. 361-413.000.

Olla, Michael A.: *See*—
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; Morrison, Barry L.; Parkinson, Ricky; Garrison, Linn; and Pace, John D., 4,627,787, Cl. 414-786.000.
Mulholland, Wayne A.; Quinn, Daniel J.; Bond, Robert H.; and Olla, Michael A., 4,627,151, Cl. 29-569.00R.

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Olson, Theodore D., Jr.: *See*—
Olson, Theodore V.; and Olson, Theodore D., Jr., 4,627,572, Cl. 239-728.000.

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Kittel, Arthur; and Gerken, Heiner, 4,627,750, Cl. 400-144.200.

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Fukuoka, Norio, 4,628,370, Cl. 360-15.000.
Iba, Yoichi, 4,627,693, Cl. 350-523.000.
Motoyama, Kazuyasu; and Kanayama, Katsumi, 4,628,390, Cl. 360-137.000.

Olympus Optical Company, Ltd: *See*—
Inoue, Akira, 4,628,229, Cl. 315-241.00P.

Omark Industries, Inc.: *See*—
Gibson, Duane M., 4,627,165, Cl. 30-166.00R.

Omori Machinery Co., Ltd.: *See*—
Omori, Shozo, 4,627,219, Cl. 53-399.000.

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Bingo, Hideyuki; Yoshimura, Takashi; Yamashita, Masatsuga; Hashizume, Shinichi; and Iwakiri, Norio, 4,628,166, Cl. 200-302.100.
Sakamoto, Tamaki; and Yoshihisa, Sakamoto, 4,627,742, Cl. 374-109.000.
Suzuki, Tadao, 4,628,192, Cl. 235-1.00R.

Omura Refractories Co., Ltd.: *See*—
Hagiwara, Hiroshi; Shirasaka, Masaru; and Moriyama, Tsunenori, 4,627,878, Cl. 106-121.000.

Onaka, Yoshiaki: *See*—
Nagai, Takaji; Ookawa, Hiroyuki; Mizuno, Takahide; Nakagawa, Fumihito; and Onaka, Yoshiaki, 4,627,828, Cl. 474-205.000.

O'Neill, Hugh, to Transport Investment Corp. Truck trailer adapted to carry fluid and dry freight and method for loading the same. 4,627,629, Cl. 280-5.00D.

O'Neill, William B. Wheel assembly. 4,627,666, Cl. 301-125.000.

Ong, Richard H.; Economopoulos, Peter C.; and Guenthner, Russell W., to Honeywell Information Systems Inc. Dual address RAM. 4,628,489, Cl. 365-230.000.

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Ono, Izumi; Manago, Iwami; Takayama, Haruo; and Takahashi, Yasuo, to Fujitsu Limited. Flexible current feeding post. 4,627,677, Cl. 339-17.00M.

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Hagiwara, Hiroshi; Shirasaka, Masaru; and Moriyama, Tsunenori, 4,627,878, Cl. 106-121.000.

Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; Toriumi, Mototada; and Nishino, Fumio, to Canon Kabushiki Kaisha. Corona discharger system. 4,627,701, Cl. 355-3.0CH.

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Kashiwa, Masahiro; Onosato, Masashi; and Takahashi, Hiroshi, 4,628,363, Cl. 358-183.000.

Onuki, Kazuhiko: *See*—
Suzuki, Hiroaki; Murata, Shinji; Shirai, Masanari; and Onuki, Kazuhiko, 4,627,703, Cl. 355-3.00R.

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Zepter, Karl H.; Opitz, Dieter; Roeder, Alfred; and Chmiel, Max, 4,627,948, Cl. 264-56.000.

Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, to Troponwerke GmbH & Co., KG. 1,4-naphthoquinone derivatives having anti-inflammatory action. 4,628,062, Cl. 514-569.000.

Opti Patent-, Forschungs- und Fabrikations-AG: *See*—
Hochlehnert, Franz; Rademacher, Werner; and Grosskreuz, Lothar, 4,627,318, Cl. 83-18.000.

Optima Spanntechnik GmbH: *See*—
Stahl, Bernhard; and Bohm, Horst, 4,627,603, Cl. 269-32.000.

Ors, Jose A.; and Small, Richard D., Jr., to AT&T Technologies, Inc. Multilayer circuit board fabrication process and polymer insulator used therein. 4,628,022, Cl. 430-280.000.

Ortho Pharmaceutical Corporation: *See*—
Pasquale, Samuel A., 4,628,051, Cl. 514-170.000.

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Osborn, Henry H., to Air Preheater Company, Inc., The. Rotary regenerative heat exchanger for high temperature applications. 4,627,485, Cl. 165-8.000.

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Kuhn, Philip A.; and Osborn, Paul V., 4,627,584, Cl. 242-54.00R.

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Johnstone, Richard; Kirkham, Edward E.; Chung, Han C.; and Ostby, Lyle D., 4,628,441, Cl. 364-167.000.

Osthoff Senge GmbH & Co. KG: *See*—
Osthoff, Walter, 4,627,135, Cl. 26-3.000.

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Otani, Susumu, to NEC Corporation. Bit error detection circuit for PSK-modulated carrier wave. 4,628,507, Cl. 371-5.000.

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Meguerdichian, Gary M.; and Hovey, Isabel B., 4,627,518, Cl. 187-29.00R.

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Otto, Bernhard: *See—*
Geiger, Erich; Otto, Bernhard; and Kaaden, Jurgen, 4,628,345, Cl. 358-13.000.
Ou, Zhiming: *See—*
Pan, Jiluan; Zhang, Renhao; Ou, Zhiming; and Wu, Zhiqion, 4,628,181, Cl. 219-130.330.
Outokumpu Oy: *See—*
Nyman, Bror G.; Hultholm, Stig-Erik; Lilja, Launo L.; and Makitalo, Valto J., 4,628,391, Cl. 366-265.000.
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Owens-Corning Fiberglas Corporation: *See—*
Bartlow, David H., 4,627,133, Cl. 24-298.000.
Bhatti, Mohinder S., 4,627,864, Cl. 65-1.000.
Kaveh, Farrokh, 4,627,868, Cl. 65-6.000.
Weirauch, Douglas A., Jr., 4,628,038, Cl. 501-35.000.
Oyama, Yoshishige: *See—*
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Ozawa, Akiyoshi: *See—*
Sekiguchi, Tsugio; Sato, Noboru; Igarashi, Hiroki; Ozawa, Akiyoshi; and Nakazawa, Iemi, 4,628,187, Cl. 219-505.000.
Pace, John D.: *See—*
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van Cauter, Gustav C.; Everett, Leroy J.; and DeFilippis, Stanley J., 4,628,205, Cl. 250-361.00R.
Paik, Michael: *See—*
Wilke, Raud A.; and Paik, Michael, 4,627,468, Cl. 137-625.660.
Pain Suppression Labs, Inc.: *See—*
Liss, Saul; and Liss, Bernard, 4,627,438, Cl. 128-419.00R.
Palla, Ottorino: *See—*
Camaggi, Giovanni; Gozzo, Franco; Signorini, Ernesto; and Palla, Ottorino, 4,628,101, Cl. 548-200.000.
Pamer, W. Richard; and Zils, James A., to Russell, Burdsall & Ward Corporation. Fastener. 4,627,776, Cl. 411-179.000.
Pan, Jiluan; Zhang, Renhao; Ou, Zhiming; and Wu, Zhiqion. Method of controlling the output characteristic of a welding power source, apparatus for arc welding, and electrical circuit to be used for such apparatus. 4,628,181, Cl. 219-130.330.
ParaSystems, Inc.: *See—*
Hachey, Francis J.; and Hachey, Henry J., 4,627,119, Cl. 5-83.000.
Paris, Bernard, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Signaling terminal system for CCITT No. 7 common channel signaling system. 4,628,505, Cl. 370-85.000.
Parker, Delbert R.; and Clark, Daren A., to A. B. Chance Company. End cap assembly for a fluid resistant electrical device. 4,628,294, Cl. 337-248.000.
Parkes, Adrian S.; Corbett, Gordon J.; Clough, Peter S.; and Barker, Colin N. H., to British Gas Corporation. Sealing joints and leaks. 4,627,471, Cl. 138-97.000.
Parkinson, Ricky: *See—*
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; Morrison, Barry L.; Parkinson, Ricky; Garrison, Linn; and Pace, John D., 4,627,787, Cl. 414-786.000.
Parlant, James B.; Etourneau, Michel; and Bled, Christian C., to Etat Francais. Electric feed device which can be started by a liquid. 4,628,401, Cl. 361-178.000.
Parsons & Whittemore, Inc.: *See—*
Eveleigh, Douglas E.; Waldron, Clarence R.; and Bartley, Timothy, 4,628,029, Cl. 435-99.000.
Pasquale, Samuel A., to Ortho Pharmaceutical Corporation. Triphasic oral contraceptive. 4,628,051, Cl. 514-170.000.
Pass, Raymond V.: *See—*
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Pattison, Timothy A., to Duracell Inc. Cell jacketing. 4,627,154, Cl. 29-623.100.
Payraud, Fernand. Monoski converter. 4,627,636, Cl. 280-607.000.
Peat, Raymond F. Pharmaceutical compositions containing dehydroepiandrosterone and other anesthetic steroids in the treatment of arthritis and other joint disabilities. 4,628,052, Cl. 514-171.000.
Peerenboom, Robert J.: *See—*
Lassen, Frederich O.; Masten, Dianne S.; Schultz, Cheri L.; and Peerenboom, Robert J., 4,627,848, Cl. 604-370.000.
Pehlgrim, Horst, to Siemens Aktiengesellschaft. Pressure or pressure difference measuring instrument. 4,627,286, Cl. 73-431.000.
Peiffer, Dennis G.; Lundberg, Robert D.; Sedillo, Lawrence P.; and Newlove, John, to Exxon Research and Engineering Company. Thermally stable borehole fluids. 4,627,926, Cl. 252-8.55R.
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Manusch, Christoph; and Scholz, Gunter, 4,627,757, Cl. 401-194.000.
Pelster, Bernhard: *See—*
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Penebre, Larry M. Swim fin. 4,627,820, Cl. 441-64.000.
Peppers, James M.; and Shaikh, Farhat A., to Dresser Industries, Inc. Measuring while drilling apparatus mud pressure signal valve. 4,628,495, Cl. 367-85.000.
Perilli, Francesco. Handheld device for ball game. 4,627,623, Cl. 273-328.000.
Perlini, Julius J.: *See—*
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Peronneau, Georges; and Chalus, Bernard, to Sotimag (SARL). Method of marking for deterring fraud with valuable documents. 4,627,642, Cl. 283-92.000.
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Peszlen, Richard A.: *See—*
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Petro, David J.; and Battaini, Steven L., to Avco Corporation. Apparatus method for calibrating and setting compressor air bleed valve schedules. 4,627,789, Cl. 415-28.000.
Petrotec Forschungs AG: *See—*
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Pfeffer, George B.: *See—*
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Pfeifer & Langen: *See—*
Langen, Arnold; Benecke, Herta; and Breithaupt, Udo, 4,627,880, Cl. 127-43.000.
Pfister, Henry F.: *See—*
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Pfizer Inc.: *See—*
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Pharmacia AB: *See—*
Agback, Karl H., 4,628,083, Cl. 534-798.000.
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Keisers, Laurenz; Artz, Gerd; Figge, Dieter; Philipp, Clemens; and Siemer, Hans, 4,627,481, Cl. 164-440.000.
Phillips Petroleum Company: *See—*
Figard, Joseph E.; Rohlfing, David C.; and Becker, Ralph S., 4,628,013, Cl. 429-111.000.
Hofferber, James A., 4,628,034, Cl. 436-55.000.
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Pierburg GmbH & Co. KG: *See—*
Bruss, Karl-Heinz; and Baumgartner, Hans, 4,627,825, Cl. 464-2.000.
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Piller, Anthony J.: *See—*
Vold, Donald J.; Spector, Saul R.; Piller, Anthony J.; and Vold, Hilda M., 4,627,658, Cl. 296-100.000.
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Kuroda, Kazuo, 4,628,371, Cl. 360-38.100.
Nishio, Takashi; and Ikeya, Tomoyoshi, 4,627,725, Cl. 356-152.000.
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Pippin, Harold G.; and Pippin, Hilma M. Portable live well. 4,627,189, Cl. 43-55.000.
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Pippin, Harold G.; and Pippin, Hilma M., 4,627,189, Cl. 43-55.000.
Pitney Bowes Inc.: *See—*
Duwel, Edward C., 4,628,476, Cl. 364-900.000.
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Meo, Joseph; and Taylor, Michael P., 4,627,749, Cl. 400-121.000.
Plaskett, John, to Frito-Lay, Inc. Apparatus for automatically closing L-slide lock cases. 4,627,217, Cl. 53-374.000.
Plaston AG: *See—*
Frei, Roland; and Gutmann, Franz, 4,627,862, Cl. 55-316.000.
Pledge Office Chairs Limited: *See—*
Carter, David E.; Bailey, Malcolm J.; and Willatts, Brian A., 4,627,662, Cl. 297-313.000.

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Martin, Eugene J., 4,627,467, Cl. 137-625.600.
Polaroid Corporation: *See—*
Fantone, Stephen D., 4,627,690, Cl. 350-421.000.
Polaroid Corporation, Patent Dept.: *See—*
Rogers, Howard G.; Gaudiana, Russell A.; and Minns, Richard A., 4,628,125, Cl. 568-730.000.
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Gaffar, Abdul; and Polefka, Thomas G., 4,627,977, Cl. 424-52.000.
Pollard, Gary B., to Hughes Aircraft Company. Ceramic package for compensated crystal oscillator. 4,627,533, Cl. 206-328.000.
Pomagalski, S.A.: *See—*
Tarassoff, Serge, 4,627,361, Cl. 104-28.000.
Pommer, Ernst-Heinrich: *See—*
Acker, Rolf-Dieter; Buschmann, Ernst; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,628,048, Cl. 514-63.000.
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Pooler, Robert E.: *See—*
Vodinh, Hien; and Pooler, Robert E., 4,628,237, Cl. 318-626.000.
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Colby, Lloyd E.; and Ingalls, John E., 4,628,171, Cl. 219-69.00G.
Porter, John E.; and Ramshaw, Colin, to Imperial Chemical Industries PLC. Centrifugal device. 4,627,890, Cl. 202-235.000.
Poschmann, Werner; Klenner, Wolfgang; Wattach, Gunter; and Maas, Peter, to International Standard Electric Corporation. Telecontrol system. 4,628,437, Cl. 364-131.000.
Post, Martin F. M.: *See—*
Minderhoud, Johannes K.; Post, Martin F. M.; Sie, Swan T.; and Sudholter, Ernst J. R., 4,628,133, Cl. 585-310.000.
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Billette de Villemeur, Philippe M.; Pournain, Gerard L.; and Cahu, Louis A., 4,627,679, Cl. 339-21.00R.
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Powell, David L.; and Bair, Philip W., 4,627,507, Cl. 177-211.000.
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PPG Industries, Inc.: *See—*
Chang, Wen-Hsuan; and McKeough, David T., 4,628,076, Cl. 525-440.000.
Kuntz, Frederick J.; and Schussler, Henry W., 4,628,122, Cl. 568-492.000.
Prasad, Rama R. S., to Occidental Petroleum Corporation. One-step process for transforming a water-in-oil emulsion into an oil-in-water emulsion. 4,627,458, Cl. 137-13.000.
Pratt, Lawrence M., to Firebox Corporation. Self-contained log fire starting kit. 4,627,854, Cl. 44-40.000.
Press-A-Lite Corporation: *See—*
Chabria, Paul R., 4,628,418, Cl. 362-116.000.
Pressman, David: *See—*
Tate, Joseph B.; and Brown, David E., 4,628,299, Cl. 340-540.000.
Presswalla, Hoshang H.; and Shea, Yale R., to INRYCO, Inc. Post-tensioned floor with in-floor distribution system. 4,627,203, Cl. 52-221.000.
Price, Edison A.: *See—*
Thigpen, F. Bruce; and Price, Edison A., 4,628,500, Cl. 369-249.000.
Price/Stern/Sloan Publishers, Inc.: *See—*
Burrows, Roger I., 4,627,819, Cl. 434-337.000.
Prieto, Yolanda: *See—*
Davis, Walter L.; and Prieto, Yolanda, 4,628,272, Cl. 329-110.000.
Prime Computer, Inc.: *See—*
Schuler, Donald; and Doshi, Mahesh, 4,628,471, Cl. 364-578.000.
Progress - Electrogeraete: *See—*
Jacob, Gernot J. M., 4,627,858, Cl. 55-126.000.
Prouteau, Didier; Hagues, Francois; Chauvin, Yves; and Commereuc, Dominique, to Institut Francais du Petrole. Process for methanol synthesis from carbon oxides and hydrogen in the presence of a soluble copper and zinc catalyst. 4,628,065, Cl. 518-700.000.
Puchta, Walter: *See—*
Henneberger, Hans; and Puchta, Walter, 4,628,527, Cl. 381-69.200.
Puff, Roger M.; and Dreuilhe, Jacques P., to Charbonnages de France; Framatome; and Institut Francais du Petrole. Fluidized-bed apparatus with a heat exchanger and an additional-air blowing network. 4,627,387, Cl. 122-4.00D.
Pugh, Richard E., to Anchor Hocking Corporation. Modular display package. 4,627,536, Cl. 206-426.000.
Puletti, Paul P.; and Decowski, Stanley J., Jr., to National Starch and Chemical Corporation. Hot melt adhesive waste barrier. 4,627,847, Cl. 604-366.000.
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Garner, Andrew; and Singbeil, Douglas L., 4,627,905, Cl. 204-404.000.
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Le Blanc, Helmut; Puppe, Lothar; and Wedemeyer, Karlfried, 4,628,097, Cl. 546-251.000.
Putman, Richard E., to Westinghouse Electric Corp. Multiplane optimization method and apparatus for cogeneration of steam and power. 4,628,462, Cl. 364-494.000.
Quackenbush, James E., to Computer Memories, Inc. Encoder output phase selection system for magnetic disk memory. 4,628,380, Cl. 360-78.000.
Quayle, George P., to Associated Electrical Industries Limited. Multipolar excitation systems. 4,628,245, Cl. 322-32.000.
Queneau, Paul B.: *See—*
Sherwood, William G.; Queneau, Paul B.; Duterque, Jean-Paul; and Hodges, Donald R., 4,627,900, Cl. 204-147.000.
Quinn, Daniel J.: *See—*
Mulholland, Wayne A.; Quinn, Daniel J.; Bond, Robert H.; and Olla, Michael A., 4,627,151, Cl. 29-569.00R.
R. E. Dietz Company: *See—*
Vescio, Donald W.; and Travers, Harry T., 4,628,415, Cl. 362-61.000.
R. J. Reynolds Tobacco Company: *See—*
Lortie, Richard P.; Vercaemert, Philippe H.; and Gunnell, Douglas L., 4,627,568, Cl. 236-44.00B.
Rademacher, Werner: *See—*
Hochlehnert, Franz; Rademacher, Werner; and Grosskreuz, Lothar, 4,627,318, Cl. 83-18.000.
Radziwill, Wolfgang; Doring, Gunter; and Steinbusch, Hans, to U.S. Philips Corporation. DC motor with electronic commutation circuit. 4,628,231, Cl. 318-138.000.
Rainbow Trading Co., Inc.: *See—*
Shimomura, Kiyoaji, 4,627,683, Cl. 339-128.000.
Raines, Kenneth C., to Burron Medical Inc. Guard for right angle infusion needle. 4,627,843, Cl. 604-263.000.
RainWise, Inc.: *See—*
Baer, John S., 4,627,277, Cl. 73-170.00R.
Raj, Kuldip; and Casciari, Raoul, to Ferrofluidics Corporation. Bearing assembly with integrated ferrofluid seal. 4,628,384, Cl. 360-97.000.
Ramsey, Maynard, III; Muskatello, James M.; Hood, Rush W., Jr.; Medero, Richard; and Stephenson, Stanley K., to Critikon, Inc. Sphygmomanometric cuff pressurizing system. 4,627,440, Cl. 128-682.000.
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Porter, John E.; and Ramshaw, Colin, 4,627,890, Cl. 202-235.000.
Randek Inc.: *See—*
Dekrone, Stephen A., 4,627,292, Cl. 73-728.000.
Ranke, Horst: *See—*
Feuerstein, Albert; Thorn, Gernot; and Ranke, Horst, 4,627,989, Cl. 427-10.000.
Rasmussen GmbH: *See—*
Sauer, Heinz, 4,627,645, Cl. 285-39.000.
Rathbun, Bonnie L.; and Schuessler, Philipp W. H., to United States of America, Navy. Passivation of hybrid microelectronic circuits. 4,628,006, Cl. 428-446.000.
Raytheon Company: *See—*
Braun, Kenneth H.; and Perlmutter, Michael S., 4,627,732, Cl. 356-350.000.
Razote, Regino V. Fishing rod assembly. 4,627,188, Cl. 43-21.000.
RCA Corporation: *See—*
Harwood, Leopold A., 4,628,346, Cl. 358-28.000.
Nossen, Edward J., 4,628,286, Cl. 332-9.00R.
Selwa, Anthony P., 4,628,539, Cl. 455-194.000.
Reader, Wayne T.: *See—*
Kramer, Irvin R.; and Reader, Wayne T., 4,628,490, Cl. 367-1.000.
Recoton Corporation: *See—*
Andreas, Sam, 4,628,361, Cl. 358-153.000.
Reddaway, Stewart F., to International Computers Limited. Data processing apparatus. 4,628,481, Cl. 364-900.000.
Redicon Corporation: *See—*
Bulso, Joseph D., Jr.; and McClung, James A., 4,627,265, Cl. 72-354.000.
Reed, David M.; and Johnson, Michael R. Disposable tray and stand. 4,627,381, Cl. 119-1.000.
Reed, Jesse L. Mudflap mounting assembly. 4,627,594, Cl. 248-632.000.
Reed, Lehman T., to Midway Fishing Tool Co. Top entry electrical transmission safety assembly for submersible pumping. 4,627,489, Cl. 166-65.100.
Reed, William R., Jr.: *See—*
Komanduri, Ranga; and Reed, William R., Jr., 4,627,317, Cl. 82-1.00C.
Reese, H. William. Osteotomy appliances and method. 4,627,425, Cl. 128-92.0VY.
Regnault, Luc, to Image S.A. Circuit for feeding ink to an ink-jet printing head. 4,628,329, Cl. 346-75.000.
Reich, Rudolf, to Aktiengesellschaft Adolph Saurer. Embroidering station with schiffli-shuttles. 4,627,368, Cl. 112-83.000.
Reich, Sharon L.: *See—*
Lindauer, Jerome I.; and Reich, Sharon L., 4,627,934, Cl. 252-522.00R.
Reichelt, Wolfgang: *See—*
Voss-Spilker, Peter; Reichelt, Wolfgang; Kubon, Achim; and Keutgen, Franz, 4,628,516, Cl. 373-72.000.
Reichmann, Werner: *See—*
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Reidenbach, Vincent G.: *See—*
Harris, Phillip C.; Reidenbach, Vincent G.; and Chisholm, Pat T., 4,627,495, Cl. 166-280.000.
Reifenhauser GmbH & Co.: *See—*
Schnell, Willi, 4,627,805, Cl. 425-72.00R.

Reighard, Robert P.; McCoy, Wilbur L.; and Gobeille, William P., to Sheller-Globe Corporation. Multifunction steering wheel. 4,628,310, Cl. 340-825.720.

Reimann, Walter: *See—*
Schweikert, Otto E.; Reimann, Walter; Wykypiel, Werner; and Mack, Karl E., 4,628,106, Cl. 548-440.000.

Reinartz, Hans-Dieter; and Steffes, Helmut, to Alfred Teves GmbH. Fluid level indicator for a reservoir. 4,628,162, Cl. 200-84.00C.

Reine, Marion B.; and Kusner, Ronald R., to Honeywell, Inc. Nondelineated detector having a differential readout. 4,628,203, Cl. 250-334.000.

Reinecke, Paul: *See—*
Gayer, Herbert; Kramer, Wolfgang; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,628,060, Cl. 514-432.000.

Reinking, Klaus: *See—*
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,628,079, Cl. 528-49.000.

Renders, Klaus-Helmut, to Maschinenfabrik Walter Scheele GmbH & Co. KG. Hydraulic actuator-control arrangement for concrete pump. 4,627,328, Cl. 91-410.000.

Rensselaer Polytechnic Institute: *See—*
Coward, James K., 4,628,090, Cl. 544-258.000.

Rentzea, Costin; Karbach, Stefan; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. N-(2,3-dihydrobenzofuran-2-yl)-azolylureas and fungicides containing these compounds. 4,628,058, Cl. 514-383.000.

Repco Limited: *See—*
Camm, John J., 4,627,668, Cl. 303-40.000.

Research Corporation: *See—*
Sprott, David J.; and Rotz, C. Alan, 4,627,338, Cl. 99-534.000.

Reum, Helmut: *See—*
Imhof, Ernst; Komaroff, Iwan; Schmid, Gunther; Grunwald, Werner; and Reum, Helmut, 4,627,405, Cl. 123-549.000.

Reynolds, Allan, to Narda Microwave Corporation, The. Hermetically sealed oscillator with dielectric resonator tuned through dielectric window by adjusting screw. 4,628,283, Cl. 331-68.000.

Reynolds Metals Company: *See—*
Melnyk, Michael, Jr., 4,627,236, Cl. 60-435.000.

Rhodes, Ronny Q.; and Duke, Jack W. Ice container having coiled strip partition. 4,627,595, Cl. 249-121.000.

Rialan, Joseph; and Thierry, Gerard, to Institut Francais du Petrole. Method for the remote control of signal acquisition devices by means of a narrow passband transmission channel and a device for the implementation of the method. 4,628,494, Cl. 307-79.000.

Ricard, Jacques, to Cibie Projecteurs. Method of manufacturing and of adjusting the orientation of a motor vehicle headlamp; and a motor vehicle headlamp for performing said method. 4,628,414, Cl. 362-61.000.

Rich, Stanley R., to Advanced Energy Dynamics, Inc. Particle charging and collecting system. 4,627,579, Cl. 241-79.100.

Richards, Barry R.: *See—*
Weimer, Charles L.; and Richards, Barry R., 4,627,680, Cl. 339-22.00B.

Richards, Harvey J.: *See—*
Goel, Anil B.; and Richards, Harvey J., 4,627,932, Cl. 252-194.000.

Richards, James: *See—*
Ulrich, Paul L.; Richards, James; and Tanke, Eugene T., II, 4,627,522, Cl. 192-35.000.

Rickard, Jimmy R.; and Hollenbeck, Robert K., to General Electric Company. Test initiating apparatus for appliances having self-diagnostic testing capability. 4,628,443, Cl. 364-184.000.

Ricoh Company, Ltd.: *See—*
Anderson, Carl P., 4,627,702, Cl. 355-3.0BE.
Ide, Youji, 4,627,997, Cl. 428-216.000.
Ishii, Yasuaki, 4,627,607, Cl. 271-122.000.
Ishikawa, Chuji, 4,628,331, Cl. 346-75.000.
Kikuno, Mitsutoyo, 4,627,715, Cl. 355-14.00R.
Nakajima, Yoshinori, 4,627,751, Cl. 400-144.200.
Tagoku, Izumi, 4,628,017, Cl. 430-48.000.
Tani, Tatsuo; Midorikawa, Akira; Ito, Masaji; Kuno, Masashi; Shinada, Masayuki; Yoshino, Hirobumi; and Nakashima, Yoshihiro, 4,627,707, Cl. 355-14.00R.

Ricoh Systems, Inc.: *See—*
Anderson, Carl P., 4,627,702, Cl. 355-3.0BE.

Rider, Billie F., to Rockwell International Corporation. Fast responding temperature transducer circuit. 4,627,745, Cl. 374-183.000.

Rill, Robert W., Jr. Standby aquarium pump. 4,627,797, Cl. 417-411.000.

Rinnai Kabushiki Kaisha: *See—*
Ito, Hiroshi; Aida, Kanae; Shinozaki, Masanobu; Koumura, Masahiko; Tamada, Kazumi; and Mizutani, Katsushi, 4,627,416, Cl. 126-351.000.

Rioux, Marc, to Canadian Patents and Development Limited. Three dimensional imaging method and device. 4,627,734, Cl. 356-376.000.

Ripani, Sergio; and Serafini, Giulio, to Carle & Montanari S.p.A. Leak-resistant feeding chamber for chocolate refining machines. 4,627,337, Cl. 99-485.000.

Rittinger, Herbert: *See—*
Faller, Peter; Rittinger, Herbert; and Gertitschke, Detlev, 4,627,225, Cl. 53-510.000.

Rivier, Jean E. F.: *See—*
Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,628,043, Cl. 514-12.000.

Rizkalla, Nabil, to Halcon SD Group, Inc., The. Preparation of acetaldehyde. 4,628,121, Cl. 568-487.000.

Roba, Giacomo, to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A. Process of manufacturing optical fibers of extremely low loss in the medium infrared. 4,627,865, Cl. 65-3.120.

Robbins, Clyde N., to General Instrument Corporation. Television signal encryption system with protected audio. 4,628,358, Cl. 358-121.000.

Robert Bosch GmbH: *See—*
Betz, Dieter, 4,627,407, Cl. 123-634.000.
Buchner, Norbert, 4,627,221, Cl. 53-425.000.
Hofmann, Karl, 4,627,574, Cl. 239-590.500.
Imhof, Ernst; Komaroff, Iwan; Schmid, Gunther; Grunwald, Werner; and Reum, Helmut, 4,627,405, Cl. 123-549.000.
Naser, Joachim; Schmid, Olaf; Schmidt, Gerhard; Sturm, Theodor; and Walter, Berthold, 4,628,290, Cl. 335-274.000.

Robert Casaretto KG: *See—*
Wildt, Eberhard, 4,627,137, Cl. 29-121.200.

Robert, Serge, to U.S. Philips Corporation. Communication network having a master-slave type series architecture and providing master-to-slave and slave-to-master communication. 4,628,308, Cl. 340-825.430.

Roberts, Gerald E.; and Toliver, Samuel, to General Electric Company. Shutter apparatus for fine-tuning a coupled-dual resonator crystal. 4,627,379, Cl. 118-721.000.

Roberts, Richard D., to Harris Corporation. Frequency-agile synchronous demodulator. 4,628,270, Cl. 329-50.000.

Robertshaw Controls Company: *See—*
Fowler, Daniel L.; and Kadwell, Brian J., 4,628,439, Cl. 364-138.000.

Robineau, Philippe; and Vincenot, Eric. Electroacoustic motor for horns. 4,628,155, Cl. 381-156.000.

Robinson, Richard C., to Chevron Research Company. Dual recycle pressure-step reformer with cyclic regeneration. 4,627,909, Cl. 208-65.000.

ROCA Technologies, Inc.: *See—*
Watson, Gary Q., 4,627,413, Cl. 126-137.000.

Rock, Gail: *See—*
Gardell, Dietlind; and Rock, Gail, 4,628,026, Cl. 435-7.000.

Rocket Industries, Inc.: *See—*
Ishida, Hiroshi; and Wang, Yujen, 4,627,610, Cl. 272-72.000.

Rockwell, Gary; and Bartlett, Randall, to Diversified Products Corporation. Abdominal and back weight type exercising device. 4,627,619, Cl. 272-134.000.

Rockwell International Corporation: *See—*
Alitz, Orville J., 4,628,318, Cl. 342-26.000.
Rider, Billie F., 4,627,745, Cl. 374-183.000.
Skipper, John D.; and Long, Steven M., 4,628,275, Cl. 330-10.000.

Rodloff, Rudiger K.; and Jungbluth, Werner W., to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Ring laser, especially for a ring laser type of gyro. 4,628,515, Cl. 372-107.000.

Roeder, Alfred: *See—*
Zepter, Karl H.; Opitz, Dieter; Roeder, Alfred; and Chmiel, Max, 4,627,948, Cl. 264-56.000.

Roeding, Gretchen W.: *See—*
McCutchan, Diane R.; Roeding, Gretchen W.; and Kibby, Gordon R., 4,627,587, Cl. 244-122.00R.

Roemac Industrial Sales, Inc.: *See—*
Roemer, Mitchel B.; and Roemer, Nicholas B., 4,627,763, Cl. 404-6.000.

Roemer, Mitchel B.; and Roemer, Nicholas B., to Roemac Industrial Sales, Inc. Vehicle barrier construction. 4,627,763, Cl. 404-6.000.

Roemer, Nicholas B.: *See—*
Roemer, Mitchel B.; and Roemer, Nicholas B., 4,627,763, Cl. 404-6.000.

Rogers, Howard G.; Gaudiana, Russell A.; and Minns, Richard A., to Polaroid Corporation, Patent Dept. Monomers containing bis(trifluoromethyl)biphenylene radicals. 4,628,125, Cl. 568-730.000.

Rogers, John D., to Amhil Enterprises Ltd. Lid for drinks container. 4,627,537, Cl. 206-501.000.

Rohde, Robert S.: *See—*
Nomiyama, Neal T.; Rohde, Robert S.; and Buser, Rudolph G., 4,628,542, Cl. 455-619.000.

Rohde, Wolfgang: *See—*
Hedden, Kurt; Beck, Kurt-Gunther; Rohde, Wolfgang; and Schumacher, Horst, 4,627,174, Cl. 34-20.000.

Rohlfing, David C.: *See—*
Figard, Joseph E.; Rohlfing, David C.; and Becker, Ralph S., 4,628,013, Cl. 429-111.000.

Rohm, Gunter H. Safety hammer lock for a hand weapon. 4,627,185, Cl. 42-66.000.

Rohm, Gunter H. Chuck for a hammer or rotary impact drill. 4,627,626, Cl. 279-1.00A.

Rohm, Gunter H. Percussion or impact drill chuck. 4,627,627, Cl. 279-19.300.

Rohm, Gunter H. Hammer drill chuck. 4,627,628, Cl. 279-20.000.

Rohn Company Limited: *See—*
Ikefuji, Yoshihiro; and Koiwa, Mitsuru, 4,628,249, Cl. 323-315.000.

Rohringer, Peter: *See—*
Bernheim, Michael; Meindl, Hubert; Rohringer, Peter; Wegmuller, Hans; and Werthemann, Dieter, 4,627,889, Cl. 162-158.000.

Rokuda, Morito: *See—*
Mita, Seiichi; Izumita, Morishi; Umemoto, Masuo; Eto, Yoshizumi; Rokuda, Morito; and Kanada, Hidehiro, 4,628,297, Cl. 340-347.0DD.

Rolf, Meinhard: *See—*
Neeff, Rutger; Rolf, Meinhard; and Muller, Walter, 4,628,093, Cl. 546-6.000.
Roller, George J.; and Thomas, Kendolph A., to Xerox Corporation. Front air knife top vacuum corrugation feeder. 4,627,605, Cl. 271-94.000.
Rolls-Royce Limited: *See—*
Conolly, Ralph I., 4,628,008, Cl. 448-548.000.
Rollscreen Company: *See—*
Cox, Timothy B., 4,627,206, Cl. 52-302.000.
Ronnhult, John; and Eklund, Jan, to BE - GE Stolindustri AB. Chair back with adjustable lumbar support. 4,627,661, Cl. 297-284.000.
Root, Robert H., to South Coast Research, Inc. Remote control system for automated equipment. 4,628,306, Cl. 340-825.000.
Rorig, Kurt J.; Djuric, Stevan W.; Fowler, Kerry W.; and Liang, Chi-Dean, to G. D. Searle & Co. Substituted N-benzyl-4-(benzhydryl) piperidines. 4,628,095, Cl. 546-234.000.
Rose, Eric; and Dresdale, Arthur, to Columbia University in the City of New York, The Trustees of. Fibrin adhesive prepared as a concentrate from single donor fresh frozen plasma. 4,627,879, Cl. 106-124.000.
Rose, Leroy: *See—*
Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,628,385, Cl. 360-99.000.
Rose, Philip M.; and Song, Yoon S., to Standard Oil Company (Indiana). Double reverse helix agitator. 4,627,735, Cl. 366-329.000.
Rosemount Engineering Company Limited: *See—*
Johnston, James S.; Holland, Leslie; and Wright, Christopher R., 4,627,902, Cl. 204-192.210.
Rosen, Josef: *See—*
Landa, Benzion; and Rosen, Josef, 4,627,705, Cl. 355-4.000.
Ross, David S., to International Tectonics Incorporated. Apparatus and method of filtering solids from a liquid effluent. 4,627,923, Cl. 210-744.000.
Ross, Ronald J.: *See—*
Gioffre, Anthony J.; and Ross, Ronald J., 4,627,972, Cl. 424-44.000.
Rossetti, Nazzareno, to SGS Semiconductor Corporation. Voltage regulator. 4,628,247, Cl. 323-314.000.
Rothmans of Pall Mall Canada Limited: *See—*
Brackmann, Warren A.; and Snaidr, Stanislav M., 4,627,447, Cl. 131-109.100.
Rotz, C. Alan: *See—*
Sprott, David J.; and Rotz, C. Alan, 4,627,338, Cl. 99-534.000.
Rowland, Robert O., to Hudson Oxygen Therapy Sales Company. Oxygen concentrator and test apparatus. 4,627,860, Cl. 55-162.000.
Royal Waterbeds, Inc.: *See—*
Winther, Howard A., 4,627,121, Cl. 5-451.000.
RTE Corporation: *See—*
Lien, Wayne W., 4,628,291, Cl. 337-203.000.
Muench, Frank J.; and Borck, Gordon T., 4,628,292, Cl. 337-204.000.
Rubin, Harvey, to AT&T Bell Laboratories. Stored program controller. 4,628,158, Cl. 379-10.000.
Ruebeling, Guenter: *See—*
Kreylos, Hans-Albert; and Zeiser, Manfred P., 4,627,136, Cl. 29-160.600.
Ruger, William B.; and Larson, Lawrence L., to Sturm, Ruger & Company, Inc. Ejector manually operable to rotate firing pin block for slide removal and disassembly. 4,627,184, Cl. 42-25.000.
Ruiz, Pierre: *See—*
Leroy, Jean; and Ruiz, Pierre, 4,627,954, Cl. 376-216.000.
Leroy, Jean; and Ruiz, Pierre, 4,627,955, Cl. 376-216.000.
Ruppert, Werner, to International Business Machines Corporation. Circuit arrangement for crosstalk compensation in electro-optical scanners. 4,628,211, Cl. 250-578.000.
Russell, Burdsall & Ward Corporation: *See—*
Pamer, W. Richard; and Zils, James A., 4,627,776, Cl. 411-179.000.
Russev, Todor Y.: *See—*
Marvakov, Ivan K.; and Russev, Todor Y., 4,628,427, Cl. 363-27.000.
Russow, Jurgen: *See—*
Tetzlaff, Karl-Heinz; Schmid, Dieter; and Russow, Jurgen, 4,627,897, Cl. 204-59.00R.
Ruth, Ursula: *See—*
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Ryan, Douglas G.; Cerkanowicz, Anthony E.; Chimenti, Robert J. L.; and Mintz, Donald J., to Exxon Research and Engineering Company. Separating wax from hydrocarbon mixture boiling in the lubricating oil range. 4,627,901, Cl. 204-190.000.
Rzedzian, Richard R., to Advanced NMR Systems, Inc. NMR gradient field modulation. 4,628,264, Cl. 324-322.000.
S.A.E.S. Getters S.p.A.: *See—*
Giorgi, Ettore, 4,628,198, Cl. 250-213.0VT.
S. C. Johnson & Son, Inc.: *See—*
Morgan, Lee W., 4,628,071, Cl. 524-832.000.
Saab-Scania Aktiebolag: *See—*
Andersson, Sven R., 4,627,559, Cl. 224-329.000.
Saar, Lawrence E. Strip lighting. 4,628,421, Cl. 362-238.000.
Saarberg-Interplan Gesellschaft fur Rohstoff-Energie und Ingenieurtechnik mbH: *See—*
Stegmann, Heinz, 4,627,500, Cl. 173-53.000.
SACE S.p.A. Costruzioni Elettromeccaniche: *See—*
Talpo, Gianpietro, 4,628,164, Cl. 200-148.00A.
Sacher, Friedrich-Josef. Projection apparatus. 4,627,696, Cl. 353-110.000.
Sachs, Emanuel M. Melt dumping in string stabilized ribbon growth. 4,627,887, Cl. 156-608.000.
Safford, Beverly: *See—*
McArthur, David T., deceased, 4,628,420, Cl. 362-208.000.
Saga, Toshihiko; Makita, Tsuyoshi; Hirono, Hisao; and Inao, Akitaka, to Honda Giken Kogyo Kabushiki Kaisha. Method of and apparatus for supplying powdery material. 4,627,990, Cl. 427-10.000.
Saga University: *See—*
Uehara, Haruo; and Nakaoka, Tsutomu, 4,628,212, Cl. 290-54.000.
Saganovsky, Abraham; and Chester, William, to KB Electronics Inc. Anti-plug reversing module. 4,628,232, Cl. 318-284.000.
Sager, John C.; Odam, Kenneth D.; Boyd, Robert T.; and Dell, Peter W., to British Telecommunications. Computer of processor control systems. 4,628,508, Cl. 371-9.000.
Sahashi, Masashi; Inomata, Koichiro; and Kobayashi, Tadahiko, to Kabushiki Kaisha Toshiba. Torque sensor of the noncontact type. 4,627,298, Cl. 73-862.360.
Saiga, Yutaka: *See—*
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,628,057, Cl. 514-292.000.
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Saint-Hubert Industrie Laitiere: *See—*
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Saita, Shinsuke: *See—*
Hamasaki, Hideaki; Maehara, Shigeharu; and Saita, Shinsuke, 4,627,704, Cl. 355-3.00R.
Saito, Chuichi, to Hitachi, Ltd. Balustrade for passenger conveyor. 4,627,527, Cl. 198-335.000.
Saito, Kenichi: *See—*
Maeda, Yuji; Yamato, Hideyuki; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,628,050, Cl. 514-167.000.
Saito, Kimitaka; Iwamoto, Kenzi; Egami, Tsuneyuki; Saito, Tsutomu; and Matuyama, Takesi, to Nippon Soken, Inc. Method and apparatus for controlling air-fuel ratio in internal combustion engine. 4,627,402, Cl. 123-440.000.
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, to Nippon Soken, Inc.; and Toyo a Jidosha Kabushiki Kaisha. Method and apparatus for controlling air-fuel ratio in internal combustion engine. 4,627,404, Cl. 123-492.000.
Saito, Makoto: *See—*
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.
Saito, Tsutomu: *See—*
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Saito, Yasuhiro: *See—*
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Saito, Yoji: *See—*
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Saito, Yoshiaki: *See—*
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Sakaguchi, Shuzabu: *See—*
Nawata, Takanari; Sakaguchi, Shuzabu; and Aoki, Osamu, 4,628,119, Cl. 564-314.000.
Sakai, Tunehiro: *See—*
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Sakai, Yasuhito, to Fuji Jukogyo Kabushiki Kaisha. Control system for an infinitely variable transmission. 4,627,313, Cl. 74-867.000.
Sakakibara, Shiro: *See—*
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Sakakibara, Yoshio: *See—*
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Sakamoto, Kenichiro: *See—*
Minematsu, Yoshihiko; Tanaka, Minoru; Sakamoto, Kenichiro; and Yamamoto, Masayuki, 4,627,786, Cl. 414-735.000.
Sakamoto, Koichiro: *See—*
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Sakamoto, Tamaki; and Yoshihisa, Sakamoto, to Omron Tateisi Electronics Co. Computer controlled electronic thermometer. 4,627,742, Cl. 374-109.000.
Sakata, Yoshiya: *See—*
Tanaka, Kimio; Shiba, Haruo; and Sakata, Yoshiya, 4,628,389, Cl. 360-132.000.
Sakatani, Takenobu; and Suzuki, Shigeru, to Lion Corporation. Additive composition for granular detergent. 4,627,927, Cl. 252-8.750.

Sakkas, Athanasios: *See*—
Sakkas, Thomas; and Sakkas, Athanasios, 4,627,652, Cl. 292-229.000.
Sakkas, Thomas; and Sakkas, Athanasios. Lock for sliding doors and windows. 4,627,652, Cl. 292-229.000.
Saku, Koji; and Horiguchi, Fumio, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device with a refresh mechanism. 4,628,488, Cl. 365-222.000.
Sakui, Koji, to Kabushiki Kaisha Toshiba. MOS dynamic random access memory. 4,628,486, Cl. 365-149.000.
Sakuma, Nobuo. Post-objective type scanning device. 4,627,685, Cl. 350-6.800.
Sakurai, Yoshio; and Tsuruo, Takashi, to Japanese Foundation for Cancer Research; and Tanabe Seiyaku Co., Ltd. Agent for enhancing antitumor activity of antitumor agent. 4,628,047, Cl. 514-34.000.
Salk Institute for Biological Studies, The: *See*—
Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,628,043, Cl. 514-12.000.
White, Christine A.; Dulbecco, Renato; and Allen, William R., 4,628,032, Cl. 435-240.000.
Salter, Anthony J. Pipe supports. 4,627,593, Cl. 248-561.000.
Samaritoni, Jack G., to Eli Lilly and Company. Preparation of substituted pyridazines. 4,628,088, Cl. 544-224.000.
Samsung Electronics Co., Ltd.: *See*—
Heo, Man Y., 4,628,351, Cl. 358-93.000.
Samuelson, Bruce E., to Minnesota Mining and Manufacturing Company. Dispenser for tape wound on three inch cores. 4,627,560, Cl. 225-66.000.
Sanagi, Shiroh: *See*—
Kawano, Tsuyoshi; Sanagi, Shiroh; and Nakajima, Koe, 4,627,881, Cl. 148-12.00C.
Sanchez, William: *See*—
Sherman, Victor; Zborovsky, Ilya; and Sanchez, William, 4,627,335, Cl. 99-325.000.
Sanden Corporation: *See*—
Matsudaira, Yasuyuki; and Hiraga, Masaharu, 4,627,800, Cl. 418-55.000.
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Sanders Associates, Inc.: *See*—
Burrows, James L., 4,628,477, Cl. 364-900.000.
Sholtis, Albert A.; and Guy, Jon S., 4,627,754, Cl. 400-649.000.
Sanderson, John R.; and Yeakey, Ernest L., to Texaco Inc. Production of 2-substituted-1,3-dioxolanes from 1,3-dioxolane and formaldehyde. 4,628,108, Cl. 549-453.000.
Sano Kiko Co., Ltd.: *See*—
Kobayashi, Takeshi; Endo, Kazuo; Nanbu, Nobumasa; and Kawamura, Yoshizi, 4,627,688, Cl. 350-173.000.
Santa Fe International Corporation: *See*—
Field, Almeron J.; Whyte, Daniel G.; and Johnson, Gerald L., 4,627,767, Cl. 405-196.000.
Santel, Hans-Joachim: *See*—
Sasse, Klaus; Eue, Ludwig; Santel, Hans-Joachim; and Schmidt, Robert R., 4,627,871, Cl. 71-92.000.
Schwamborn, Michael; Kuhle, Engelbert; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, 4,627,872, Cl. 71-92.000.
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Soderstrom, Gunnar T., 4,627,882, Cl. 148-14.000.
Sanyo Electric Co., Ltd.: *See*—
Okumura, Yuuzi, 4,628,382, Cl. 360-93.000.
Sardina, Helion H., to Lummus Crest, Inc. Dehydrogenation process for production of styrene from ethylbenzene comprising low temperature heat recovery and modification of the ethylbenzene-steam feed therewith. 4,628,136, Cl. 585-441.000.
Sasaki, Hideharu; Sawaki, Toru; and Yoshioka, Yoshiaki, to Teijin Limited. Pitch-based carbon or graphite fiber and process for preparation thereof. 4,628,001, Cl. 428-367.000.
Sasaki, Ryoichi: *See*—
Mizuno, Kenji; and Sasaki, Ryoichi, 4,627,748, Cl. 400-17.000.
Sasaki, Toshio: *See*—
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,628,456, Cl. 364-449.000.
Sasaki, Yoshitaka, to Hitachi Metals, Ltd. Thermal fixing apparatus. 4,627,813, Cl. 432-60.000.
Sasashige, Hiroaki: *See*—
Hirakawa, Tadashi; Yoshikawa, Kiyomitsu; Yoshioka, Shigenari; and Sasashige, Hiroaki, 4,627,831, Cl. 493-337.000.
Sasse, Klaus; Eue, Ludwig; Santel, Hans-Joachim; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal 2-[4-substituted carboxyamino-phenoxy (or phenyl mercapto)]-substituted pyrimidines. 4,627,871, Cl. 71-92.000.
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, to Jujo Paper Co., Ltd.; and Yoshitomi Pharmaceutical Industries Ltd. Thermosensitive recording sheet. 4,628,336, Cl. 346-209.000.
Sato, Fumitaka; and Nagura, Kunihiro. Data processing system having a local memory which does not use a directory device with distributed resident programs and a method therefor. 4,628,450, Cl. 364-200.000.
Sato, Hiroyuki: *See*—
Yamazawa, Yasushi; Tsutiya, Yasuhiro; Terada, Masaki; Aoki, Tosio; and Sato, Hiroyuki, 4,627,307, Cl. 74-552.000.
Sato, Kunihiko: *See*—
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,627,404, Cl. 123-492.000.
Sato, Maki; and Hashimoto, Takeo, to Sony Corporation. Charge transfer device for multiplexing signals. 4,628,347, Cl. 358-39.000.
Sato, Makoto: *See*—
Matsuda, Shohei; and Sato, Makoto, 4,627,670, Cl. 303-115.000.
Sato, Masayoshi; Harada, Noritake; and Suzuki, Kunio. Convertible ink scraper device corresponding to reverse-rotatable mesh roller. 4,627,350, Cl. 101-350.000.
Sato, Noboru: *See*—
Sekiguchi, Tsugio; Sato, Noboru; Igarashi, Hiroki; Ozawa, Akiyoshi; and Nakazawa, Iemi, 4,628,187, Cl. 219-505.000.
Sato, Noritada: *See*—
Seki, Yasukazu; Sato, Noritada; and Ishiwata, Osamu, 4,627,991, Cl. 427-39.000.
Satomura, Hiroshi, to Canon Kabushiki Kaisha. Heating-fixing roller and fixing device having the same. 4,628,183, Cl. 219-216.000.
Sauer, Heinz, to Rasmussen GmbH. Flexible pipe coupling. 4,627,645, Cl. 285-39.000.
Saukkonen, Harri: *See*—
Aalto, Erkki; Saukkonen, Harri; and Hasa, Juhani, 4,627,498, Cl. 169-42.000.
Savin Corporation: *See*—
Landa, Benzion; and Rosen, Josef, 4,627,705, Cl. 355-4.000.
Sawada, Hideo; and Yata, Kiyoshi, to Hitachi, Ltd. Data processing apparatus for virtual memory system. 4,628,451, Cl. 364-200.000.
Sawada, Katsuji; Kimijima, Yoshiaki; and Umehara, Hidetoshi, to Mikuni Kogyo Kabushiki Kaisha. Liquid fuel combustion apparatus. 4,627,412, Cl. 126-110.00B.
Sawada, Kazuo: *See*—
Isobe, Shinichi; and Sawada, Kazuo, 4,628,442, Cl. 364-167.000.
Sawada, Satoru; and Nishiyama, Shingo, to Fuji Photo Film Co., Ltd. Heat developable color photographic materials with silver halide containing iodide. 4,628,021, Cl. 430-203.000.
Sawaki, Toru: *See*—
Sasaki, Hideharu; Sawaki, Toru; and Yoshioka, Yoshiaki, 4,628,001, Cl. 428-367.000.
Saxena, Vinit, to Sepragen Corporation. Chromatography column using horizontal flow. 4,627,918, Cl. 210-656.000.
Say, Donald L.: *See*—
Collins, Floyd K.; and Say, Donald L., 4,628,224, Cl. 313-414.000.
Scan Optics, Inc.: *See*—
Stone, David H.; Pintsov, Leon A.; and D'Amato, Donald P., 4,628,532, Cl. 382-21.000.
Scarfo, Corrado; and Scarfo, Paolo. Watercraft provided with trim stabilizers utilizing different fluids. 4,627,376, Cl. 114-272.000.
Scarfo, Paolo: *See*—
Scarfo, Corrado; and Scarfo, Paolo, 4,627,376, Cl. 114-272.000.
Scarpa, Afra; and Scarpa, Tobia, to Centro Studi e Servizi Moda di Paola Bertagnin E C. S.A.S. Clothes hanger assembly. 4,627,544, Cl. 211-189.000.
Scarpa, Tobia: *See*—
Scarpa, Afra; and Scarpa, Tobia, 4,627,544, Cl. 211-189.000.
Schaefer, Edward J., to Franklin Electric Co., Inc. Electric motor control. 4,628,236, Cl. 318-558.000.
Schafer, Norbert: *See*—
Kurz, Dieter; and Schafer, Norbert, 4,628,226, Cl. 315-102.000.
Schaper, Helmut: *See*—
Kindermann, Wolfgang; Kloster, Ernst; Leupers, Hans-Joachim; and Schaper, Helmut, 4,627,235, Cl. 60-415.000.
Scharf, Udo; Schlingmann, Merten; and von Rymon Lipinski, Gert-Wolfhard, to Hoechst Aktiengesellschaft. Functional protein hydrolyzates, a process for their preparation, use of these protein hydrolyzates as a food additive, and foods containing these protein hydrolyzated. 4,627,983, Cl. 426-7.000.
Scharnowski, Gerhard: *See*—
Brausfeld, Walter; Gottling, Helmut; Moller, Rudolf; Muller, Peter; and Scharnowski, Gerhard, 4,627,597, Cl. 251-129.030.
Schaub, Herbert R., to Union Carbide Corporation. Gas supply system for variable demand application. 4,627,243, Cl. 62-52.000.
Scheepens, Antonius H. J. M.; van Hell, Hans; and Theunissen, Hendrikus J. J., to Akzo N.V. Immunological assay with test tube having bottom forming a strip. 4,628,036, Cl. 436-520.000.
Scheiwiller, Rolf. Paving stone, process for manufacturing same and device for carrying out the manufacturing process. 4,627,764, Cl. 404-41.000.
Schering Corporation: *See*—
Sherlock, Margaret H., 4,628,055, Cl. 514-249.000.
Schertler, Siegfried: *See*—
Ehmig, Gerhard, 4,627,599, Cl. 251-334.000.
Schiller, Gunter, to SMS Schloemann-Siemag AG. Roll stand with axially shiftable working rolls. 4,627,261, Cl. 72-247.000.
Schilly, Helmut: *See*—
Brandner, Burkhard; Schilly, Helmut; Stubs, Albert; and Stojek, Dieter, 4,627,401, Cl. 123-439.000.
Schindel, Leon H.: *See*—
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Schleicher, Siegfried: *See*—
Kirchner, Balthasar; and Schleicher, Siegfried, 4,627,535, Cl. 206-387.000.
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Scharf, Udo; Schlingmann, Merten; and von Rymon Lipinski, Gert-Wolfhard, 4,627,983, Cl. 426-7.000.

Schlosser, Erich J., to Weber-Stephen Products Co. Vaporizing element for portable grill. 4,627,408, Cl. 126-41.00R.

Schlumberger Technology Corporation: *See*—
Burgess, Trevor M.; and Lesso, William G., Jr., 4,627,276, Cl. 73-151.000.

Schmid, Dieter: *See*—
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Schmid, Gunther: *See*—
Imhof, Ernst; Komaroff, Iwan; Schmid, Gunther; Grunwald, Werner; and Reum, Helmut, 4,627,405, Cl. 123-549.000.

Schmid, Olaf: *See*—
Naser, Joachim; Schmid, Olaf; Schmidt, Gerhard; Sturm, Theodor; and Walter, Berthold, 4,628,290, Cl. 335-274.000.

Schmid, Richard G.: *See*—
Campisi, Carl; Lev, Abraham; and Schmid, Richard G., 4,627,157, Cl. 29-741.000.

Schmid, Rolf; Zondler, Helmut; Fischer, Michael; and Stauffer, Werner, to Ciba-Geigy Corporation. Novel imidazolides and their use as curing agents for polyepoxide compounds. 4,628,105, Cl. 548-341.000.

Schmid, Willi, to W. Schmid AG. Signal lamp. 4,628,419, Cl. 362-145.000.

Schmidt, Erwin; Gunther, Dieter; and Kampe, Klaus-Dieter, to Hoechst Aktiengesellschaft. 2-ketosulfonamides and process for their preparation. 4,628,109, Cl. 560-13.000.

Schmidt, Gerhard: *See*—
Naser, Joachim; Schmid, Olaf; Schmidt, Gerhard; Sturm, Theodor; and Walter, Berthold, 4,628,290, Cl. 335-274.000.

Schmidt, Harald: *See*—
Morell, Josef; and Schmidt, Harald, 4,627,570, Cl. 239-90.000.

Schmidt, Robert R.: *See*—
Sasse, Klaus; Eue, Ludwig; Santel, Hans-Joachim; and Schmidt, Robert R., 4,627,871, Cl. 71-92.000.
Schwamborn, Michael; Kuhle, Engelbert; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, 4,627,872, Cl. 71-92.000.

Schmitt, Jerry A., to High Voltage Engineering Corporation. Tri-layer tubing. 4,627,844, Cl. 604-264.000.

Schmitt, Walter, to Dr. Johannes Heidenhain GmbH. Scanning signal balancing circuit. 4,628,201, Cl. 250-237.00G.

Schmitz-Montz, Hans-Helmut, to Linde Aktiengesellschaft; and Atlas Copco Aktiebolag of Nacka. Piston assembly for a compressor or the like. 4,627,795, Cl. 417-267.000.

Schmotz, Ernst; and Stelzl, Hans, to Siemens Aktiengesellschaft. Casing for electrical components, component assemblies or integrated circuits. 4,628,146, Cl. 174-52.0PE.

Schneider, Johann: *See*—
Wusthof, Peter; Schneider, Johann; and Schulz, Ewald, 4,627,801, Cl. 418-61.00B.

Schneider, Lynn A.: *See*—
Herbert, Donald L.; Schneider, Lynn A.; and Kovacs, Zoltan, 4,627,545, Cl. 213-100.00R.

Schneider, Martin: *See*—
Dorn, Reimund; and Schneider, Martin, 4,628,514, Cl. 372-36.000.

Schnell, Willi, to Reifenhauser GmbH & Co. Vertical foil-blowing head. 4,627,805, Cl. 425-72.00R.

Scholefield, Clifford L., to General Electric Company. System for charging a rechargeable battery. 4,628,242, Cl. 320-2.000.

Scholly, Werner: *See*—
Elfert, Bernd; and Scholly, Werner, 4,628,207, Cl. 250-461.100.

Scholz, Gunter: *See*—
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Schon & Cie. Gesellschaft mit beschrankter Haftung: *See*—
Winter, Gerhard, 4,627,124, Cl. 12-12.400.

Schonfeld, Harald; and Bauer, Angelo, to Carl Schenck AG. Device for balancing of rotors without journals. 4,627,747, Cl. 384-113.000.

Schoonmaker, Charles D.: *See*—
Bardsley, Robert F.; Finucane, Thomas P.; Hebel, Carl; Schoonmaker, Charles D.; and Wruk, Philip J., 4,627,986, Cl. 426-112.000.

Schramm, Matthias: *See*—
Goldmann, Siegfried; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,628,107, Cl. 549-23.000.

Schron, Steven M., to Xerox Corporation. Machine shutdown control. 4,627,711, Cl. 355-14.0SH.

Schuessler, Philipp W. H.: *See*—
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Lassen, Frederich O.; Masten, Dianne S.; Schultz, Cheri L.; and Peerenboom, Robert J., 4,627,848, Cl. 604-370.000.

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Tennessen, Rick L.; Schulz, Harry W.; and Vanderzee, Allen J., 4,627,253, Cl. 72-4.000.

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Schumacher, Ignatius, to Monsanto Company. Vapor phase nitration of aromatic compounds. 4,628,131, Cl. 568-937.000.

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Lorenz, Manfred; and Schundehutte, Karl H., 4,628,082, Cl. 534-707.000.

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Kuntz, Frederick J.; and Schussler, Henry W., 4,628,122, Cl. 568-492.000.

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Second, Paul. Background projection system for photography. 4,627,697, Cl. 354-77.000.

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Nance, Edwin P.; Segan, Marc H.; and Terzian, Berj A., 4,627,737, Cl. 368-239.000.

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Belart, Juan; Weise, Lutz; and Seibert, Wolfram, 4,627,669, Cl. 303-114.000.

Seibold, Gerhard: *See*—
Dorn, Reimund; Ebner, Heinz; Gundert, Johann; Halder, Ernst; Haspel, Werner; Isert, Ingo; Kuhnemann, Gunter; Lutz, Felix; Seibold, Gerhard; and Wessel, Gerhard, 4,627,687, Cl. 350-96.200.

Seidler, Wolfgang. Process for the production of spherical metallic particles. 4,627,943, Cl. 264-14.000.

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Badenhop, Charles T.; Bourguignon, Anna-Luise; and Fischer, Joachim, 4,627,992, Cl. 427-244.000.

Seki, Katsura: *See*—
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Sensormatic Electronics Corporation: *See—*
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Serfaty, Salomon; and Cohen, Mordechay, to Motorola, Inc. Modified duobinary filter using saw technique. 4,628,474, Cl. 364-825.000.
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Vold, Donald J.; Spector, Saul R.; Piller, Anthony J.; and Vold, Hilda M., 4,627,658, Cl. 296-100.000.
Seyedin, Saeid; and Thomas, Thomas, to Collagen Corporation. Partially purified bone-inducing factor. 4,627,982, Cl. 424-95.000.
Seyfried, Donald N.: *See—*
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SGS Semiconductor Corporation: *See—*
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Shanklin, William C. Portable, nestable beverage brewing system. 4,627,334, Cl. 99-306.000.
Sharkey, Hubert J., to National Distillers and Chemical Corporation. Process for the ozonization of α,β-unsaturated cyclohexanones to 5-ketoalkanoic acids. 4,628,117, Cl. 562-577.000.
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Komaki, Shigeki, 4,627,736, Cl. 368-88.000.
Matsui, Hirotoshi, 4,627,753, Cl. 400-174.000.
Shiono, Fusahiro; and Komai, Kensaku, 4,628,452, Cl. 364-405.000.
Tomino, Tadashi; and Higuchi, Masayuki, 4,627,676, Cl. 339-17.0CF.
Shea, Thomas M. Tool for cleaning the interior surfaces of a container. 4,627,128, Cl. 15-236.00R.
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Bentham, Jeremy B., 4,627,941, Cl. 261-109.000.
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Minderhoud, Johannes K.; Post, Martin F. M.; Sie, Swan T.; and Sudholter, Ernst J. R., 4,628,133, Cl. 585-310.000.
Stitzlein, Teddy K.; and Simonds, William P., 4,628,511, Cl. 371-22.000.
Sheller-Globe Corporation: *See—*
Reighard, Robert P.; McCoy, Wilbur L.; and Gobeille, William P., 4,628,310, Cl. 340-825.720.
Shen, Kuo C., to K. C. Shen Technology International Ltd. Process for manufacturing composite products from lignocellulosic materials. 4,627,951, Cl. 264-109.000.
Sherlock, Margaret H., to Schering Corporation. Method for treating allergic reactions and compositions therefore. 4,628,055, Cl. 514-249.000.
Sherman, Robert C., to Messina, Carl J. Spray-suppressing mud flap assembly. 4,627,631, Cl. 280-154.50R.
Sherman, Victor; Zborovsky, Ilya; and Sanchez, William. Apparatus for cooking food. 4,627,335, Cl. 99-325.000.
Sherrill, Jimmy L., to Tutco, Inc. Duct heater. 4,628,190, Cl. 219-532.000.
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Sherwood, William G.; Queneau, Paul B.; Duterque, Jean-Paul; and Hodges, Donald R., to Amax Inc. Electrochemical dissolution and control of nickel sulfide scale. 4,627,900, Cl. 204-147.000.
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Nebergall, Perry A.; and French, Robert C., 4,628,168, Cl. 219-10.810.
Shilling, Thomas W.: *See—*
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Shimizu, Hiroshi. Compost toilet apparatus. 4,627,116, Cl. 4-111.600.
Shimomura, Kiyosji, to Rainbow Trading Co., Inc. Electrical outlet. 4,627,683, Cl. 339-128.000.
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Shin Etsu Chemical Co., Ltd.: *See—*
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Shingo, Ichikawa; Nakagawa, Hisahide; Kano, Hayao; and Kudo, Koji, to Citizen Watch Co., Ltd. Bracelet type wrist watch. 4,627,739, Cl. 368-282.000.
Shinohara, Shigeru; Suzuki, Shun; and Innami, Tatsuo, to Hitachi Koki Company, Limited. Computerized circuit arrangement for jig saw. 4,628,459, Cl. 364-475.000.
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Shurman, Louis W.; and Bell, Thomas W., to Firestone Tire & Rubber Company, The. Tire construction utilizing low-twist body ply yarn with high turn-up ends. 4,627,479, Cl. 152-541.000.
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Simon, Istvan. Two-stroke internal combustion engine. 4,627,389, Cl. 123-25.00C.

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Site Microsurgical Systems, Inc.: *See—*
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Skipper, John D.; and Long, Steven M., to Rockwell International Corporation. Efficient power amplifier for high capacitive devices. 4,628,275, Cl. 330-10.000.

Skutecki, Edmund, to Sperry Corporation. Cross axis torque limiter for helicopter autopilot. 4,628,455, Cl. 364-434.000.

Small, Kenneth T., to Boschert Inc. Proportional transistor base drive circuit for use in power converters. 4,628,432, Cl. 363-56.000.

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Smayling, Michael C., to Texas Instruments Incorporated. Dual slope, feedback controlled, EEPROM programming. 4,628,487, Cl. 365-185.000.

Smidt, Joseph J. Box-erecting machine. 4,627,830, Cl. 493-316.000.

Smith, Brad L.; Torrence, George P.; and Aguilo, Adolfo, to Celanese Corporation. Rhodium and iodine recovery method. 4,628,041, Cl. 502-24.000.

Smith, Gerald R.; and Thompson, William R., to United States of America, Interior. Electrolytic cell and methods combining electrowinning and electrochemical reactions employing a membrane or diaphragm. 4,627,899, Cl. 204-95.000.

Smith, Kenneth R.; Johnston, Kent H.; LaRue, George S.; Mueller, Robert A.; and Tabor, Steven A., to Tektronix, Inc. Method of packaging integrated circuit chips, and integrated circuit package. 4,628,406, Cl. 361-386.000.

Smith, Leedice S. Simulated log end unit for buildings. 4,627,204, Cl. 52-233.000.

Smith, Norman F., Jr.: *See—*
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Smith, Richard D.: *See—*
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Smulders, Hendricus F. G.; Hagen, Johannes L. M.; and Dona, Marinus J. J., to U.S. Philips Corporation. Positioning device comprising pre-stressed contactless bearings. 4,628,238, Cl. 318-653.000.

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Olson, Gene E.; and Kot, Norbert J., 4,627,761, Cl. 403-324.000.

Societe Anonyme dite: Aaton Rg.: *See—*
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S.A. Texaco Belgium N.V.: *See—*
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Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux-Efcis^2: *See—*
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Soderstrom, Gunnar T., to Santrade Limited. Method of making a rotary drill bit. 4,627,882, Cl. 148-14.000.

Sodick Co., Ltd.: *See—*
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Solar Turbines, Inc.: *See—*
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Solloway, Daniel S. Hydrodynamic jumper. 4,627,613, Cl. 272-116.000.

Sommer, Bernd: *See—*
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Sommer, Peter: *See—*
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Song, Yoon S.: *See—*
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Sony Corporation: *See—*
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Okada, Takashi; and Mogi, Takao, 4,628,359, Cl. 358-122.000.
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Sosinski, Ronald T.: *See—*
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Sotimag (SARL): *See—*
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Soto, Henry L. Illuminated wind sock. 4,627,278, Cl. 73-188.000.

South Coast Research, Inc.: *See—*
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Temple, Carroll G.; Montgomery, John A.; and Elliott, Robert D., 4,628,089, Cl. 544-244.000.

Spahrbier, Dieter, to Varta Batterie Aktiengesellschaft. Explosion-proof, hermetically sealed galvanic cell. 4,628,012, Cl. 429-53.000.

Spanjer, Keith G., to Motorola Inc. Method for applying material to a semiconductor wafer. 4,627,988, Cl. 427-5.000.

Sparton Corporation: *See—*
Douglas, Norman F., 4,628,315, Cl. 340-870.260.

Spector, Saul R.: *See—*
Vold, Donald J.; Spector, Saul R.; Piller, Anthony J.; and Vold, Hilda M., 4,627,658, Cl. 296-100.000.

Spectral Sciences, Inc.: *See—*
Gersh, Michael E.; Bien, Fritz; and Bernstein, Lawrence S., 4,627,284, Cl. 73-336.500.

Speraw, Floyd G., to NCR Corporation. Card cassette ejector apparatus. 4,628,413, Cl. 361-415.000.

Sperlich, Josef, to ANT Nachrichtentechnik GmbH. Method for transmitting communications services via satellites. 4,628,506, Cl. 370-104.000.

Speronello, Barry K., to Engelhard Corporation. Porous mullite. 4,628,042, Cl. 502-263.000.

Sperry Corporation: *See—*
Berndt, Dale F., 4,628,217, Cl. 307-467.000.
Skutecki, Edmund, 4,628,455, Cl. 364-434.000.

Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., to Salk Institute for Biological Studies, The. Hypothalamic GRF agonists. 4,628,043, Cl. 514-12.000.

Spilhaus, Athelstan. Map puzzle having periodic tesselated structure. 4,627,622, Cl. 273-157.00R.

Spillman, Donald W.; and Shilling, Thomas W., to Imagex, Inc. Digital X-ray scanner. 4,628,356, Cl. 358-111.000.

Sporck, Claus L., to Hag A/S. Mechanical lifting device. 4,627,602, Cl. 267-182.000.

Sprott, David J.; and Rotz, C. Alan, to Research Corporation. Apparatus for the treatment of ruminant forage material or soil. 4,627,338, Cl. 99-534.000.

SS Indus.: *See—*
Ewing, Paul E.; and Grubb, B. Randall, 4,627,665, Cl. 299-79.000.

Staalkat B.V.: *See—*
Menger, Jan W., 4,628,520, Cl. 377-6.000.

Stadlmann, Wilfried, to Transamerica Delaval Inc. Control systems for magnetic recording tapes. 4,628,375, Cl. 360-71.000.

Staefa Control System Inc.: *See—*
Morris, John C., 4,627,569, Cl. 236-49.000.

Stahl, Bernhard; and Bohm, Horst, to Optima Spanntechnik GmbH. Clamping device. 4,627,603, Cl. 269-32.000.

Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Open-end friction spinning machine. 4,627,230, Cl. 57-401.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,627,230, Cl. 57-401.000.

Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Light-sensitive compound mixture and copying material comprising o-naphthquinonediazide compound. 4,628,020, Cl. 430-165.000.

Standard Oil Company: *See—*
Bodine, John H.; and Bork, Jonathan, 4,628,491, Cl. 367-45.000.
Desmond, Michael J.; Weinert, Raymond J., Jr.; Ball, Lawrence E.; and Benton, Kenneth C., 4,628,077, Cl. 526-90.000.

Standard Oil Company (Indiana): *See—*
Rose, Philip M.; and Song, Yoon S., 4,627,735, Cl. 366-329.000.

Standard Textile Co. Inc.: *See—*
Hopp, Marcel F., 4,627,122, Cl. 5-484.000.

Stark, Robert G., Jr.: *See—*
Stark, Robert G., Sr.; Stark, Robert G., Jr.; Stark, Tom; and Anderson, Joseph W., 4,627,466, Cl. 137-625.500.
Stark, Robert G., Sr.; Stark, Robert G., Jr.; Stark, Tom; and Anderson, Joseph W. Valve and actuator. 4,627,466, Cl. 137-625.500.
Stark, Tom: *See—*
Stark, Robert G., Sr.; Stark, Robert G., Jr.; Stark, Tom; and Anderson, Joseph W., 4,627,466, Cl. 137-625.500.
Stauffer Chemical Company: *See—*
Nagubandi, Sreeramulu, 4,627,870, Cl. 71-86.000.
Stauffer, Werner: *See—*
Schmid, Rolf; Zondler, Helmut; Fischer, Michael; and Stauffer, Werner, 4,628,105, Cl. 548-341.000.
Steel City Corporation, The: *See—*
Fibus, C. Kenneth, 4,627,566, Cl. 232-1.00C.
Steffes, Helmut: *See—*
Reinartz, Hans-Dieter; and Steffes, Helmut, 4,628,162, Cl. 200-84.00C.
Stegmann, Heinz, to Saarberg-Interplan Gesellschaft fur Rohstoff-Energie und Ingenieurtechnik mbH. Coal-compacting power-hammer rod activator. 4,627,500, Cl. 173-53.000.
Steigerwald, Robert L., to General Electric Company. Dual output DC-DC converter with independently controllable output voltages. 4,628,426, Cl. 363-17.000.
Steinbusch, Hans: *See—*
Radziwill, Wolfgang; Doring, Gunter; and Steinbusch, Hans, 4,628,231, Cl. 318-138.000.
Stelzl, Hans: *See—*
Schmotz, Ernst; and Stelzl, Hans, 4,628,146, Cl. 174-52.0PE.
Stephen, John F.: *See—*
Nelson, Richard V.; and Stephen, John F., 4,628,096, Cl. 546-250.000.
Stephenson, Stanley K.: *See—*
Ramsey, Maynard, III; Muskatello, James M.; Hood, Rush W., Jr.; Medero, Richard; and Stephenson, Stanley K., 4,627,440, Cl. 128-682.000.
Steyr-Daimler-Puch AG: *See—*
Morell, Josef; and Schmidt, Harald, 4,627,570, Cl. 239-90.000.
Stickel, Oskar: *See—*
Mayr, Albert; and Stickel, Oskar, 4,627,238, Cl. 60-452.000.
Stiefel Laboratories, Inc.: *See—*
Wittes, James M., 4,627,129, Cl. 15-244.00C.
Stillwell, Merriam B. Easel. 4,627,592, Cl. 248-465.000.
Stitzlein, Teddy K.; and Simonds, William P., to Shell Oil Company. Apparatus for analysis of computer channel failures. 4,628,511, Cl. 371-22.000.
Stock, Donald F.: *See—*
Winkelbauer, Howard M.; Wang, Ke-Chin; Walther, Frank H., Jr.; and Stock, Donald F., 4,627,945, Cl. 264-29.500.
Stojek, Dieter: *See—*
Brandner, Burkhard; Schilly, Helmut; Stubs, Albert; and Stojek, Dieter, 4,627,401, Cl. 123-439.000.
Stolar, Morris: *See—*
Levitt, Barrie; and Stolar, Morris, 4,628,056, Cl. 514-270.000.
Stone, David H.; Pintsov, Leon A.; and D'Amato, Donald P., to Scan Optics, Inc. Alphanumeric handprint recognition. 4,628,532, Cl. 382-21.000.
Stopinc Aktiengesellschaft: *See—*
Kagi, Otto, 4,627,147, Cl. 29-515.000.
Storie, Lyndola M. Body suit. 4,627,111, Cl. 2-69.000.
Storopack, Hans Reichenecker GmbH & Co.: *See—*
Voss, Gerd, 4,627,947, Cl. 264-53.000.
Stoy, Erich, to SMS Schloemann-Siemag AG. Positioning actuator for six-high roll stand. 4,627,300, Cl. 74-89.150.
Strassler, Sigfrid: *See—*
Forster, Martin; and Strassler, Sigfrid, 4,627,269, Cl. 73-23.000.
Strato Medical Corporation: *See—*
Fenton, Paul V., Jr., 4,627,835, Cl. 604-67.000.
Stratton, Richard W.; Nicolet, Michel; and Andrews, Glenn, to Gesellschaft zur Forderung der Industrieorientierten Forschung an den Schweizerischen Hochschulen und Weiteren Institutionen. Nuclear fuel rod with porous plug closure. 4,627,957, Cl. 376-412.000.
Stricker, Alfred A.: *See—*
Brady, William A., Jr.; Jordan, Stanley R.; Morgado, Eugenio J.; Perlini, Julius J.; and Stricker, Alfred A., 4,627,829, Cl. 493-189.000.
Stubs, Albert: *See—*
Brandner, Burkhard; Schilly, Helmut; Stubs, Albert; and Stojek, Dieter, 4,627,401, Cl. 123-439.000.
Stuckman, Lowell R. Firearm with aiming light. 4,627,183, Cl. 42-1.010.
Studer, Lewis O., to Moore, Harry V., a part interest. Self-leveling ladder construction. 4,627,516, Cl. 182-202.000.
Stumpff, Phillip W.: *See—*
Taylor, Richard D.; and Stumpff, Phillip W., 4,627,675, Cl. 339-14.00R.
Sturm, Ruger & Company, Inc.: *See—*
Ruger, William B.; and Larson, Lawrence L., 4,627,184, Cl. 42-25.000.
Sturm, Theodor: *See—*
Naser, Joachim; Schmid, Olaf; Schmidt, Gerhard; Sturm, Theodor; and Walter, Berthold, 4,628,290, Cl. 335-274.000.
Sturrock, Peter E.; and O'Brien, Gerald E., to Georgia Tech. Research Institute. Rapid-sweep electrochemical detector for chemical analysis of flow streams. 4,628,463, Cl. 364-497.000.
Sucher, Daniel J.: *See—*
Buonomo, Joseph P.; Losinger, Raymond E.; Oliver, Burton L.; and Sucher, Daniel J., 4,628,445, Cl. 364-200.000.
Sudbrack, Cecil R.; Bowen, Linwood H.; and Bigelow, Donald O., to New Holland, Inc. Bale density control sensing apparatus and method. 4,627,341, Cl. 100-41.000.
Sudhaus Schloss- und Beschlagetechnik GmbH & Co.: *See—*
Hauschulte, Franz, 4,627,650, Cl. 292-113.000.
Sudholter, Ernst J. R.: *See—*
Minderhoud, Johannes K.; Post, Martin F. M.; Sie, Swan T.; and Sudholter, Ernst J. R., 4,628,133, Cl. 585-310.000.
Suematsu, Koshi; Ikeda, Takeshi; Yamamoto, Atsuko; Goto, Koji; and Imai, Eiichi, to Canon Kabushiki Kaisha. Process for developing electrostatic images and toner therefor. 4,628,019, Cl. 430-106.600.
Suenaga, Tatsuo: *See—*
Akihama, Shigeyuki; Suenaga, Tatsuo; Saito, Makoto; Ikeda, Hideki; Aya, Masanori; Koyama, Seiichi; Kamakura, Masashi; Mikami, Naoto; and Miyuki, Hideaki, 4,627,998, Cl. 428-285.000.
Suga, Michihisa; and Tsuzuki, Mitsuo, to NEC. Ink-jet recording apparatus. 4,628,330, Cl. 346-75.000.
Suga, Shigeru. Light-resistance tester for maintaining uniform temperature at surface of sample. 4,627,287, Cl. 73-865.600.
Sugishima, Eiichi, to Mitsubishi Denki Kabushiki Kaisha. Overload protecting circuit for an inverter device. 4,628,395, Cl. 361-18.000.
Sugiura, Yasuyuki: *See—*
Morinaga, Shigeki; Sugiura, Yasuyuki; Miyashita, Kunio; and Takahashi, Tadashi, 4,628,314, Cl. 340-870.240.
Suling, Carlhans: *See—*
Winkel, Jens; Klein, Gerhard; Meier, Helmut-Martin; Suling, Carlhans; and Arlt, Dieter, 4,628,112, Cl. 560-160.000.
Sullivan, James B.; and Fox, Richard B. Molded shoe innersole. 4,627,178, Cl. 36-44.000.
Sumi, Kiyohide: *See—*
Takagaki, Katsumi; Ito, Yukinori; and Sumi, Kiyohide, 4,627,521, Cl. 192-2.000.
Sumida, Shizuo: *See—*
Yokooku, Katsuhiko; Seo, Nobuhide; Oda, Hiroyuki; Sumida, Shizuo; and Yatomi, Satoshi, 4,627,311, Cl. 74-866.000.
Sumitomo Chemical Company, Limited: *See—*
Kato, Toshiro, 4,628,049, Cl. 514-147.000.
Sumitomo Electric Industries Ltd.: *See—*
Kanamori, Hiroo; Tanaka, Gotaro; and Chida, Kazunori, 4,627,866, Cl. 65-3.120.
Miyake, Masaya; Saito, Yasuhiro; and Higuchi, Matsuo, 4,628,178, Cl. 219-121.0LD.
Tanaka, Gotaro; Kanamori, Hiroo; and Mizutani, Futoshi, 4,627,867, Cl. 65-3.120.
Yamaguchi, Jun, 4,628,016, Cl. 430-30.000.
Sumitomo Special Metals Co., Ltd.: *See—*
Wada, Toshiaki, 4,627,733, Cl. 356-359.000.
Sundstrand Corporation: *See—*
Beck, Richard, Jr., 4,627,330, Cl. 92-12.200.
Durtschi, William G., 4,627,329, Cl. 91-506.000.
Hutson, Allan I., 4,627,237, Cl. 60-487.000.
Schuh, Paul A., 4,627,234, Cl. 60-39.281.
Troscinski, Mark A., 4,628,219, Cl. 310-68.00D.
Suplinskas, Raymond J.; Henze, Thomas W.; and Marzik, James V., to Avco Corporation. Silicon carbide monofilament for transverse composite properties. 4,628,002, Cl. 428-367.000.
Sutt, Robert F., Jr., to Calgon Carbon Corporation. Carbon molecular sieves and a process for their preparation and use. 4,627,857, Cl. 55-70.000.
Sutton, Gordon W.: *See—*
Kelly, Felix T.; Newey, David C.; and Sutton, Gordon W., 4,627,812, Cl. 431-7.000.
Suzuki, Atsuo: *See—*
Kitsukawa, Motohiko; and Suzuki, Atsuo, 4,627,254, Cl. 72-6.000.
Suzuki, Hidetake: *See—*
Nakayama, Yoshiro; and Suzuki, Hidetake, 4,628,338, Cl. 357-15.000.
Suzuki, Hiroaki; Murata, Shinji; Shirai, Masanari; and Onuki, Kazuhiko, to Canon Kabushiki Kaisha. Apparatus for forming images from positive and negative originals. 4,627,703, Cl. 355-3.00R.
Suzuki, Keisuke: *See—*
Tsuchihashi, Genichi; and Suzuki, Keisuke, 4,628,120, Cl. 568-322.000.
Suzuki, Kunio: *See—*
Sato, Masayoshi; Harada, Noritake; and Suzuki, Kunio, 4,627,350, Cl. 101-350.000.
Suzuki, Masahiko: *See—*
Kuroyanagi, Masatoshi; Suzuki, Masahiko; Horiuchi, Yasuhiro; Matsui, Kazuma; Moriguchi, Kouichi; and Hashimoto, Yukio, 4,627,793, Cl. 417-203.000.
Suzuki, Motomu: *See—*
Ogura, Ichiro; Suzuki, Motomu; Fujii, Senzo; and Honda, Michitaka, 4,628,355, Cl. 358-111.000.
Suzuki, Osamu: *See—*
Komiyama, Choji; and Suzuki, Osamu, 4,627,534, Cl. 206-387.000.
Suzuki, Shigeru: *See—*
Sakatani, Takenobu; and Suzuki, Shigeru, 4,627,927, Cl. 252-8.750.
Suzuki, Shun: *See—*
Shinohara, Shigeru; Suzuki, Shun; and Innami, Tatsuo, 4,628,459, Cl. 364-475.000.
Suzuki, Tadao, to Omron Tateisi Electronics Co. Cash handling machine. 4,628,192, Cl. 235-1.00R.

Svensson, Kent O.: *See—*
Mathiesen, Mait M.; and Svensson, Kent O., 4,627,855, Cl. 44-51.000.
Swedo, Raymond J.: *See—*
Zupancic, Joseph J.; and Swedo, Raymond J., 4,627,859, Cl. 55-158.000.
Swendrowski, Steven: *See—*
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; Morrison, Barry L.; Parkinson, Ricky; Garrison, Linn; and Pace, John D., 4,627,787, Cl. 414-786.000.
Symbas, Panagiotis N.; Baisden, J. Lee; and Kezios, Stothe P. Sternal retractor. 4,627,421, Cl. 128-20.000.
Syoji, Mitsuo: *See—*
Shimakata, Masashi; Kawamura, Katsuaki; Tsuchiya, Toshiaki; Shioya, Yuichiro; Inoue, Takao; Syoji, Mitsuo; and Kuroda, Keiichi, 4,628,537, Cl. 455-34.000.
System Development Corporation: *See—*
Boyle, Richard C., 4,628,303, Cl. 340-661.000.
Szarka, David D., to Halliburton Company. Isolation gravel packer. 4,627,488, Cl. 166-51.000.
Szentesi, Otto I., to Siecor Corporation. Splicing tray for optical fibers. 4,627,686, Cl. 350-96.200.
T. Ghiglia: *See—*
Hall, Dennis E., 4,627,659, Cl. 297-488.000.
Tabak, Samuel A.: *See—*
Gould, Ronald M.; and Tabak, Samuel A., 4,628,134, Cl. 585-331.000.
Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., 4,628,135, Cl. 585-331.000.
Tabor, Steven A.: *See—*
Smith, Kenneth R.; Johnston, Kent H.; LaRue, George S.; Mueller, Robert A.; and Tabor, Steven A., 4,628,406, Cl. 361-386.000.
Tachikawa, Keiichi: *See—*
Ise, Yoji; Kato, Minoru; and Tachikawa, Keiichi, 4,627,362, Cl. 104-23.200.
Tachikawa Spring Co. Ltd.: *See—*
Kon, Shigeki, 4,627,660, Cl. 297-219.000.
Tachiuchi, Tsuguji; and Honda, Toyota, to Hitachi, Ltd. Common memory control system with two bus masters. 4,628,482, Cl. 364-900.000.
Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, to Madza Motor Corporation. Intake system for rotary piston engines. 4,627,395, Cl. 123-216.000.
Tagoku, Izumi, to Ricoh Company, Limited. Electrostatic image forming method. 4,628,017, Cl. 430-48.000.
Tahara, Yoshinori, to Mei San Co., Ltd. Marking apparatus for coloring lateral edge of sheet. 4,627,380, Cl. 118-77.000.
Taisho Pharmaceutical Co., Ltd.: *See—*
Shimano, Kimihide; Shimamura, Haruo; Yamaguchi, Hiroshi; Murayama, Hiroshi; Kaneko, Ryohei; and Seki, Katsura, 4,627,981, Cl. 424-84.000.
Takagaki, Katsumi; Ito, Yukinori; and Sumi, Kiyohide, to Fuji Jukogyo Kabushiki Kaisha. Motor and brake controls. 4,627,521, Cl. 192-2.000.
Takagi, Tadao, to Nippon Kogaku K. K. Automatic focusing adaptor for camera lens. 4,627,699, Cl. 354-400.000.
Takahashi, Akio; and Petrella, Robert G., to Air Products and Chemicals, Inc. Triethylenediamine containing acetylenic alcohols as flow aids. 4,628,092, Cl. 544-351.000.
Takahashi, Hiroaki; Yamazaki, Shigeru; Noguchi, Takaharu; and Arai, Takao, to Hitachi, Ltd. Rotating head type magnetic record/reproduce apparatus. 4,628,373, Cl. 360-62.000.
Takahashi, Hiroshi: *See—*
Kashiwa, Masahiro; Onosato, Masashi; and Takahashi, Hiroshi, 4,628,363, Cl. 358-183.000.
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,627,404, Cl. 123-492.000.
Takahashi, Kenji: *See—*
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,628,456, Cl. 364-449.000.
Takahashi, Seiji; Miyazaki, Masayuki; Hirabayashi, Tsugio; and Makawa, Yoshikazu, to Konishiroku Photo Industry Co., Ltd. Sorting machine and image reproducing apparatus. 4,627,706, Cl. 355-14.05SH.
Takahashi, Tadashi; Hayashida, Hiroshi; Miyashita, Kunio; and Sekizawa, Sadao, to Hitachi, Ltd. Magneto resistive sensor for detecting movement of a rotating body. 4,628,259, Cl. 324-208.000.
Takahashi, Tadashi: *See—*
Morinaga, Shigeki; Sugiura, Yasuyuki; Miyashita, Kunio; and Takahashi, Tadashi, 4,628,314, Cl. 340-870.240.
Takahashi, Tsuneo: *See—*
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,628,456, Cl. 364-449.000.
Takahashi, Yasuo: *See—*
Ono, Izumi; Manago, Iwami; Takayama, Haruo; and Takahashi, Yasuo, 4,627,677, Cl. 339-17.00M.
Takahashi, Yuichi; Tasaki, Akira; Itami, Teruhiko; and Tomiyama, Shunsuke, to Fuji Xerox Co., Ltd. Thermomagnetic recording apparatus. 4,628,328, Cl. 346-74.400.
Takai, Kazuki, to Clarion Co., Ltd. Ejection mechanism for tape player. 4,628,381, Cl. 360-93.000.
Takamatsu, Ryoji; Umezawa, Kouji; and Toyoguchi, Tsutomu, to Sony Corporation. Disc loading apparatus for use in a disc player. 4,628,498, Cl. 369-77.100.
Takata, Akihiko, to Scovill Japan Kabushiki Kaisha. Ball-side piece of snap fastener. 4,627,134, Cl. 24-687.000.
Takata, Toshihiko; and Nakayama, Yoshiharu, to Yamaha Hatsudoki Kabushiki Kaisha. Porting system for internal combustion engine. 4,627,400, Cl. 123-432.000.
Takayama, Haruo: *See—*
Ono, Izumi; Manago, Iwami; Takayama, Haruo; and Takahashi, Yasuo, 4,627,677, Cl. 339-17.00M.
Takayama, Makoto, to Canon Kabushiki Kaisha. Differential phase shift keying demodulator. 4,628,271, Cl. 329-50.000.
Takayama, Nobutoshi, to Canon Kabushiki Kaisha. Information signal recording and/or reproducing apparatus. 4,628,378, Cl. 360-77.000.
Takeda Chemical Industries, Ltd.: *See—*
Nohara, Akira; and Maki, Yoshitaka, 4,628,098, Cl. 546-271.000.
Yada, Hideo; Akaba, Kunihisa; and Mukaiyama, Megumi (said Hideo Yada assors. to), 4,627,985, Cl. 426-92.000.
Takeda, Kazuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic mail processing apparatus. 4,627,540, Cl. 209-555.000.
Takematsu, Tetsuo; Kikkawa, Nobuyuki; and Ogawa, Hideaki, to Idemitsu Kosan Company Limited. N-(α,α-dialkylbenzyl)-phenylacetamide compounds and herbicidal compositions containing said compounds. 4,627,874, Cl. 71-118.000.
Takenaka, Akihiko, to Nippondenso Co., Ltd. Ignition distributor. 4,627,393, Cl. 123-146.50A.
Takeuchi, Hiroshi; Nakaya, Chitose; Umemura, Shinichiro; and Katakura, Kageyoshi, to Hitachi, Ltd.; and Hitachi Medical Corporation. Composite ceramic/polymer piezoelectric material. 4,628,223, Cl. 310-358.000.
Takuwa, Toshiaki: *See—*
Hori, Katsuyoshi; Watanabe, Eiji; Myoga, Toshiharu; Takuwa, Toshiaki; and Kusano, Kazuki, 4,628,182, Cl. 219-130.510.
Talley, Robert L.: *See—*
Hahn, William F.; McAdams, Hirimie T.; and Talley, Robert L., 4,627,576, Cl. 241-24.000.
Talpo, Gianpietro, to SACE S.p.A. Costruzioni Elettromeccaniche. Arc contact system for electrical circuit breakers, in particular of the type using an arc extinguishing fluid. 4,628,164, Cl. 200-148.00A.
Talvalkar, Shashi G.; and Besselman, Thomas P., to NCR Corporation. Thermal transfer formulation and medium. 4,628,000, Cl. 428-341.000.
Tamada, Kazumi: *See—*
Ito, Hiroshi; Aida, Kanae; Shinozaki, Masanobu; Koumura, Masahiko; Tamada, Kazumi; and Mizutani, Katsushi, 4,627,416, Cl. 126-351.000.
Tanabe Seiyaku Co., Ltd.: *See—*
Iijima, Ikuo; Saiga, Yutaka; Miyagishima, Toshikazu; Matsuoka, Yuzo; and Matsumoto, Mamoru, 4,628,057, Cl. 514-292.000.
Sakurai, Yoshio; and Tsuruo, Takashi, 4,628,047, Cl. 514-34.000.
Tanaka, Fujio; Nagao, Yasuyuki; and Imamura, Nobutake, to Kokusai Denshin Denwa Kabushiki Kaisha. Magneto-optical recording medium. 4,628,485, Cl. 365-122.000.
Tanaka, Gotaro; Kanamori, Hiroo; and Mizutani, Futoshi, to Sumitomo Electric Industries, Ltd. Method for producing highly pure glass preform for optical fiber. 4,627,867, Cl. 65-3.120.
Tanaka, Gotaro: *See—*
Kanamori, Hiroo; Tanaka, Gotaro; and Chida, Kazunori, 4,627,866, Cl. 65-3.120.
Tanaka, Kimio; Shiba, Haruo; and Sakata, Yoshiya, to TDK Corporation. Lock member for the lid of a magnetic tape cassette. 4,628,389, Cl. 360-132.000.
Tanaka, Minoru: *See—*
Minematsu, Yoshihiko; Tanaka, Minoru; Sakamoto, Kenichiro; and Yamamoto, Masayuki, 4,627,786, Cl. 414-735.000.
Tandem Computers Incorporated: *See—*
Zardiackas, Fredrick L., 4,628,449, Cl. 364-200.000.
Tang, Reginald T-H.: *See—*
Mares, Frank; Tang, Reginald T-H.; Galle, James E.; and Federici, Rose M., 4,628,085, Cl. 540-539.000.
Tani, Tatsuo; Midorikawa, Akira; Ito, Masaji; Kuno, Masashi; Shinada, Masayuki; Yoshino, Hirobumi; and Nakashima, Yoshihiro, to Ricoh Company, Ltd. Copier with image editing function. 4,627,707, Cl. 355-14.00R.
Tanizawa, Ryozo: *See—*
Yokota, Tohru; Inoue, Kaname; Tanizawa, Ryozo; Asou, Hideyuki; and Kitamura, Hajime, 4,628,070, Cl. 524-504.000.
Tanke, Eugene T., II: *See—*
Ulrich, Paul L.; Richards, James; and Tanke, Eugene T., II, 4,627,522, Cl. 192-35.000.
Tano, Hirofumi: *See—*
Fukumura, Sadaaki; Hashimoto, Takeji; and Tano, Hirofumi, 4,628,326, Cl. 346-29.000.
Tarassoff, Serge, to Pomagalski, S.A. Overhead cable transport installation with regular spaced load supporting carriages. 4,627,361, Cl. 104-28.000.
Tarlton, Curtis S.; and Ford, Richard A., to C. & T. Tarlton, Inc. Spiral conveyor. 4,627,529, Cl. 198-778.000.
Taro Pharmaceutical Industries Ltd.: *See—*
Levitt, Barrie; and Stolar, Morris, 4,628,056, Cl. 514-270.000.
Tasaki, Akira: *See—*
Takahashi, Yuichi; Tasaki, Akira; Itami, Teruhiko; and Tomiyama, Shunsuke, 4,628,328, Cl. 346-74.400.

Tashiro, Keisuke, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and NGK Insulators, Ltd. Ceramic tip cast in valve rocker arm. 4,627,392, Cl. 123-90.390.

Tashiro, Tsutomu; Haruna, Koichi; and Komoda, Norihisa, to Hitachi, Ltd. Facilities control method. 4,628,434, Cl. 364-130.000.

Tashiro, Tsutomu; Haruna, Koichi; and Komoda, Norihis, to Hitachi, Ltd. Facilities control method. 4,628,435, Cl. 364-130.000.

Tashiro, Yasuhisa: *See—*
Mashiba, Akihiro; Hagita, Kazuteru; Miyazawa, Yoshinobu; Saino, Tetsushi; and Tashiro, Yasuhisa, 4,628,111, Cl. 560-159.000.

Tasman Pulp and Paper Company Limited: *See—*
Whyte, Donald M., 4,627,578, Cl. 241-30.000.

Tate, John R. Golf accessory. 4,627,621, Cl. 273-32.00B.

Tate, Joseph B.; and Brown, David E., to Pressman, David, a part interest. Seismic warning system using RF energy monitor. 4,628,299, Cl. 340-540.000.

Tavis Corporation: *See—*
Tavis, John A., 4,627,281, Cl. 73-302.000.

Tavis, John A., to Tavis Corporation. Tank gaging system. 4,627,281, Cl. 73-302.000.

Taylor, Carl R.: *See—*
Gagen, Paul F.; Kuhl, Jane F.; Mettler, Stephen C.; and Taylor, Carl R., 4,627,942, Cl. 264-1.500.

Taylor, Michael P.: *See—*
Meo, Joseph; and Taylor, Michael P., 4,627,749, Cl. 400-121.000.

Taylor, Richard D.; and Stumpff, Phillip W. Wiring system with quick connect wire terminals. 4,627,675, Cl. 339-14.00R.

TDK Corporation: *See—*
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,628,009, Cl. 428-694.000.
Tanaka, Kimio; Shiba, Haruo; and Sakata, Yoshiya, 4,628,389, Cl. 360-132.000.

Techne Electronics Ltd.: *See—*
Ho, Eugene Y., 4,628,400, Cl. 361-172.000.

Technical Arts Corporation: *See—*
White, Steven J., 4,628,469, Cl. 364-560.000.

Technip Geoproduction: *See—*
Thomas, Pierre-Armand; and Naudin, Jean-Claude, 4,627,768, Cl. 405-198.000.

Tecumseh Products Company: *See—*
Morse, Robert L., 4,627,247, Cl. 62-503.000.

Teijin Limited: *See—*
Sasaki, Hideharu; Sawaki, Toru; and Yoshioka, Yoshiaki, 4,628,001, Cl. 428-367.000.

Tektronix, Inc.: *See—*
Bristol, L. Rodney, 4,628,254, Cl. 324-77.00R.
Smith, Kenneth R.; Johnston, Kent H.; LaRue, George S.; Mueller, Robert A.; and Tabor, Steven A., 4,628,406, Cl. 361-386.000.

Telefonaktiebolaget L M Ericsson: *See—*
Morwing, Bo A.; Andersson, Bengt L.; and Gustavsson, Per-Olof G., 4,628,319, Cl. 342-46.000.

Telefonaktiebolaget LM Ericsson: *See—*
Akerberg, Dag E., 4,628,152, Cl. 379-51.000.

TeleMeter Corporation: *See—*
Gombrich, Peter P.; Case, Steven K.; and Konicek, Lawrence R., 4,628,313, Cl. 340-870.020.

Temple, Carroll G.; Montgomery, John A.; and Elliott, Robert D., to Southern Research Institute. Pyrido(2,3-D)pyrimidines. 4,628,089, Cl. 544-244.000.

Tempo Instrument Incorporated: *See—*
Weiss, Gerhart, 4,627,182, Cl. 40-447.000.

Tengs, Anthony M. Article of wearing apparel with an erasable writing surface. 4,627,110, Cl. 2-69.000.

Tenneco Canada Inc.: *See—*
Fredette, Maurice C. J.; and Yang, Ching-Shi, 4,627,969, Cl. 423-478.000.

Tennessen, Rick L.; Schulz, Harry W.; and Vanderzee, Allen J., to Verson Allsteel Press Co. Fault detection system for continuously running transfer press. 4,627,253, Cl. 72-4.000.

Terada, Kunio: *See—*
Usui, Seiji; and Terada, Kunio, 4,627,624, Cl. 277-12.000.

Terada, Masaki: *See—*
Yamazawa, Yasuahi; Tsutiya, Yasuhiro; Terada, Masaki; Aoki, Tosio; and Sato, Hiroyuki, 4,627,307, Cl. 74-552.000.

Terasawa, Koji, to Canon Kabushiki Kaisha. Ink jet recording head and ink jet recorder. 4,628,333, Cl. 346-140.00R.

Terauchi, Kiyoshi, to Sanden Corporation. Axial sealing mechanism for a scroll type fluid displacement apparatus. 4,627,799, Cl. 418-55.000.

Terhune, James H.; and Gordon, Gerald M., to General Electric Company. Corrosive impurity sensor. 4,628,252, Cl. 324-65.0CR.

Ternstrom, Maj I., to Molnlycke AB. Incontinence shield for men. 4,627,846, Cl. 604-349.000.

Terzian, Berj A.: *See—*
Nance, Edwin P.; Segan, Marc H.; and Terzian, Berj A., 4,627,737, Cl. 368-239.000.

Teske, Eldor M. Automobile hinge pin remover. 4,627,141, Cl. 29-275.000.

Tetenborg, Konrad, to Windmoller & Holscher. Large sack comprising a double-walled outer sack and an inserted inner sack. 4,628,535, Cl. 383-24.000.

Tetzlaff, Karl-Heinz; Schmid, Dieter; and Russow, Jurgen, to Hoechst Aktiengesellschaft. Process for the electrolysis of liquid electrolytes using film flow techniques. 4,627,897, Cl. 204-59.00R.

Texaco Inc.: *See—*
Kalfoglou, George, 4,627,494, Cl. 166-274.000.
Sanderson, John R.; and Yeakey, Ernest L., 4,628,108, Cl. 549-453.000.

Texas Instruments Incorporated: *See—*
Lou, Perry W., 4,628,215, Cl. 307-297.000.
Smayling, Michael C., 4,628,487, Cl. 365-185.000.

Thackrey, James D. Distorted-pool mercury switch. 4,628,161, Cl. 200-61.470.

Theeuwes, Felix: *See—*
Deters, Joseph C.; Theeuwes, Felix; Mullins, Kevin J.; and Eckenhoff, James B., 4,627,850, Cl. 604-892.000.
Wong, Patrick S. L.; and Theeuwes, Felix, 4,627,851, Cl. 604-892.000.

Theobald, Michael R.: *See—*
Laylock, Rick A.; and Theobald, Michael R., 4,627,302, Cl. 74-360.000.

Theunissen, Hendrikus J. J.: *See—*
Scheepens, Antonius H. J. M.; van Hell, Hans; and Theunissen, Hendrikus J. J., 4,628,036, Cl. 436-520.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Continuous action track leveling, lining and tamping machine. 4,627,358, Cl. 104-7.200.

Theurer, Josef; and Hansmann, Johann, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile track leveling, lining and tamping machine. 4,627,360, Cl. 104-7.200.

Thieme, Werner: *See—*
Breuckmann, Bernd; and Thieme, Werner, 4,627,729, Cl. 356-347.000.

Thierry, Gerard: *See—*
Rialan, Joseph; and Thierry, Gerard, 4,628,494, Cl. 307-79.000.

Thigpen, F. Bruce; and Price, Edison A., to Eminent Technology, Inc.; and Edison Price, Inc. Air bearing straight line tracking phonograph tonearm. 4,628,500, Cl. 369-249.000.

Tholander, Lars H. G., to Aktiebolaget IRO. Yarn storing, feeding and measuring device. 4,627,474, Cl. 139-452.000.

Thomas & Betts Corporation: *See—*
Biswas, Ranjit, 4,627,678, Cl. 339-17.0CF.

Thomas, Dalton A. Apparatus for circulating cleaning fluid through a cooling system. 4,627,798, Cl. 417-415.000.

Thomas, Gilles, to Thomson CSF. Integrated circuit structure comprising CMOS transistors having high blocking voltage capability and method of fabrication of said structure. 4,628,341, Cl. 357-42.000.

Thomas, Gunter: *See—*
Goldmann, Siegfried; Franckowiak, Gerhard; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,628,107, Cl. 549-23.000.

Thomas, Kendolph A.: *See—*
Roller, George J.; and Thomas, Kendolph A., 4,627,605, Cl. 271-94.000.

Thomas, Pierre-Armand; and Naudin, Jean-Claude, to Technip Geoproduction. Locking device for oil platforms. 4,627,768, Cl. 405-198.000.

Thomas, Thomas: *See—*
Seyedin, Saeid; and Thomas, Thomas, 4,627,982, Cl. 424-95.000.

Thompson, Arthur H.; Katz, Alan J.; and Krohn, Christine E., to Exxon Production Research Co. Method and means for determining physical properties from measurements of microstructure in porous media. 4,628,468, Cl. 364-556.000.

Thompson-Chemtrex, Inc.: *See—*
Bowes, H. David; and Kuhn, Edward S., 4,627,790, Cl. 415-53.00R.

Thompson, David R., to Pico Electronics Limited. Electrical appliance control. 4,628,440, Cl. 364-140.000.

Thompson, Gordon L.; Gudgeon, Brian; and Wombwell, Kenneth J., to International Computers Limited. Printed circuit boards. 4,628,409, Cl. 361-403.000.

Thompson, Kenneth H. Safeguard for serrated twist-off bottle cap. 4,627,548, Cl. 215-295.000.

Thompson, Michael D.; and Imes, Clifford W., IV, to Xerox Corporation. Cleaning apparatus for a xerographic reproducing apparatus. 4,627,717, Cl. 355-15.000.

Thompson, Norman C.: *See—*
Chadwick, Peter E.; Moon, Philip A. K.; and Thompson, Norman C., 4,628,518, Cl. 375-88.000.

Thompson, Richard C., executor: *See—*
Havens, Glenn G., deceased; and Thompson, Richard C., executor, 4,627,573, Cl. 239-542.000.

Thompson, Thomas J.: *See—*
Beaver, Earl R.; Lester, J. Harvey, Jr.; and Thompson, Thomas J., 4,627,940, Cl. 260-501.110.

Thompson, William L., to Babcock & Wilcox Company, The. Electronics for fiber optic vortex shedding flow meter. 4,628,197, Cl. 250-227.000.

Thompson, William R.: *See—*
Smith, Gerald R.; and Thompson, William R., 4,627,899, Cl. 204-95.000.

Thomson Components-Mostek Corporation: *See—*
Bond, Robert H.; Swendrowski, Steven; Olla, Michael A.; Morrison, Barry L.; Parkinson, Ricky; Garrison, Linn; and Pace, John D., 4,627,787, Cl. 414-786.000.
Mulholland, Wayne A.; Quinn, Daniel J.; Bond, Robert H.; and Olla, Michael A., 4,627,151, Cl. 29-569.00R.

Thomson Components-Mostok Corporation: *See—*
Lee, Robert D., 4,628,250, Cl. 323-317.000.

Thomson CSF: *See—*
Boue, Philippe, 4,628,352, Cl. 358-93.000.
Desmons, Gerard; and Marchand, Gilles, 4,628,342, Cl. 358-10.000.
Thomas, Gilles, 4,628,341, Cl. 357-42.000.

Thomson CSF Telephone: *See—*
Cartret, Roger; and Volpe, Giovanni, 4,628,447, Cl. 364-200.000.
Thordarson, Gunnar G.; and Bido , Sven O., to U.S. Philips Corporation. Fuse for projectiles. 4,627,351, Cl. 102-213.000.
Thorn Emi Automation Limited: *See—*
Neasham, David L., 4,628,244, Cl. 320-48.000.
Thorn, Gernot: *See—*
Feuerstein, Albert; Thorn, Gernot; and Ranke, Horst, 4,627,989, Cl. 427-10.000.
Thorn, Walter, to MTU Friedrichshafen GmbH. Pivotal slide valve. 4,627,567, Cl. 236-34.500.
Tinios, Pantelis G., to Westinghouse Electric Corp. Pulse wheel system with shaft mounting. 4,628,200, Cl. 250-231.0SE.
Tire-Gator, Inc.: *See—*
Holiman, William E.; and O'Keefe, Henry, 4,627,581, Cl. 241-167.000.
Toben, Michael P.: *See—*
Nobel, Fred I.; Martin, James L.; and Toben, Michael P., 4,628,165, Cl. 200-268.000.
Tobita, Kuniharu: *See—*
Kobayashi, Yoshio; Tobita, Kuniharu; and Kishimoto, Kazuo, 4,627,804, Cl. 425-71.000.
Tocco, Inc.: *See—*
West, William D., 4,628,167, Cl. 219-10.570.
Todter, Heinrich, to Hermann Berstorff Maschinenbau GmbH. Device for opening the roll nip in an apparatus comprising a pair of rollers. 4,627,262, Cl. 72-248.000.
Tojo, Shigeki: *See—*
Kato, Masaaki; Nakatsuka, Hirotaka; Tojo, Shigeki; and Arai, Kazuyoshi, 4,627,571, Cl. 239-90.000.
Tokico Ltd.: *See—*
Yoshida, Takeomi; Yamashita, Kazuhisa; and Miura, Yukio, 4,627,552, Cl. 222-14.000.
Yoshida, Takeomi; Yamashita, Kazuhisa; and Miura, Yukio, 4,627,553, Cl. 222-14.000.
Tokinaga, Daizo; Kobayashi, Teruaki; and Imai, Kazumichi, to Hitachi, Ltd. Immunoassay method. 4,628,035, Cl. 436-518.000.
Toko, Inc.: *See—*
Endou, Kunihisa, 4,628,148, Cl. 174-52.0PE.
Tokyo Cosmos Electric Co., Ltd.: *See—*
Sekiguchi, Tsugio; Sato, Noboru; Igarashi, Hiroki; Ozawa, Akiyoshi; and Nakazawa, Iemi, 4,628,187, Cl. 219-505.000.
Tokyo Electric Co., Ltd.: *See—*
Kitagawa, Tohru; and Sakamoto, Koichiro, 4,628,296, Cl. 338-3.000.
Yagi, Norio; and Nuita, Akira, 4,627,752, Cl. 400-144.200.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Hashimoto, Kazuhiko, 4,628,340, Cl. 357-42.000.
Masuoka, Fujio, 4,627,153, Cl. 29-571.000.
Murao, Yutaka, 4,628,448, Cl. 364-200.000.
Ogura, Ichiro; Suzuki, Motomu; Fujii, Senzo; and Honda, Michitaka, 4,628,355, Cl. 358-111.000.
Omori, Shozo, 4,627,219, Cl. 53-399.000.
Saku, Koji; and Horiguchi, Fumio, 4,628,488, Cl. 365-222.000.
Takeda, Kazuo, 4,627,540, Cl. 209-555.000.
Toliver, Samuel: *See—*
Roberts, Gerald E.; and Toliver, Samuel, 4,627,379, Cl. 118-721.000.
Tom McGuane Industries, Inc.: *See—*
Johnstone, David L., 4,627,463, Cl. 137-510.000.
Tomino, Tadashi; and Higuchi, Masayuki, to Sharp Kabushiki Kaisha. Electronic assembly including integrated circuit package and liquid crystal display panel. 4,627,676, Cl. 339-17.0CF.
Tomiyama, Shunsuke: *See—*
Takahashi, Yuichi; Tasaki, Akira; Itami, Teruhiko; and Tomiyama, Shunsuke, 4,628,328, Cl. 346-74.400.
Tomori, Yasumasa, to Asahi Kogaku Kogyo Kabushiki Kaisha. Cam grooves for displacing lenses. 4,627,691, Cl. 350-429.000.
Tonomura, Kenichi: *See—*
Endo, Shuichi; and Tonomura, Kenichi, 4,628,510, Cl. 371-21.000.
Toriumi, Mototada: *See—*
Onoda, Shigeyoshi; Nomura, Akihiro; Mizutani, Morikazu; Kanemitsu, Shinji; Toriumi, Mototada; and Nishino, Fumio, 4,627,701, Cl. 355-3.0CH.
Torrence, George P.: *See—*
Smith, Brad L.; Torrence, George P.; and Aguilo, Adolfo, 4,628,041, Cl. 502-24.000.
Toshimitsu, Yoshihiko; Aoyama, Toshihiko; and Ishida, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Damping force-variable damper device for vehicles provided with power steering device. 4,627,637, Cl. 280-714.000.
'totes', incorporated: *See—*
Okuda, Toshio; and Wu, Tsun-Zong, 4,627,455, Cl. 135-25.00A.
Toyo Stauffer Chemical Co., Ltd.: *See—*
Tsuchihashi, Genichi; and Suzuki, Keisuke, 4,628,120, Cl. 568-322.000.
Toyoda Gosei Co., Ltd.: *See—*
Hayashi, Chikahisa; Kawai, Makoto; and Adachi, Mikio, 4,627,280, Cl. 73-290.00R.
Mabuchi, Akira; Uchida, Sadao; and Ishikake, Masanao, 4,627,638, Cl. 280-779.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Ohta, Takeshi; Yamakage, Tetsuro; and Sakakibara, Yoshio, 4,628,458, Cl. 364-474.000.
Toyoguchi, Tsutomu: *See—*
Takamatsu, Ryoji; Umezawa, Kouji; and Toyoguchi, Tsutomu, 4,628,498, Cl. 369-77.100.
Toyomaki, Kazuya: *See—*
Hikawa, Kazuo; Toyomaki, Kazuya; and Yamazaki, Hiroyuki, 4,628,282, Cl. 331-1.00A.
Toyota Jidosha Kabushiki Kaisha: *See—*
Saito, Kimitaka; Kohama, Tokio; Egami, Tsuneyuki; Saito, Tsutomu; Takahashi, Hiroshi; and Sato, Kunihiko, 4,627,404, Cl. 123-492.000.
Yamazawa, Yasushi; Tsutiya, Yasuhiro; Terada, Masaki; Aoki, Tosio; and Sato, Hiroyuki, 4,627,307, Cl. 74-552.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Matsui, Kazuma; Hattori, Yoshiyuki; Imani, Yuichi; Kuno, Akira; and Nomura, Yoshihisa, 4,627,671, Cl. 303-116.000.
Transamerica Delaval Inc.: *See—*
Stadlmann, Wilfried, 4,628,375, Cl. 360-71.000.
Transnuclear GmbH: *See—*
Botzem, Werner; and Schlich, Elmar, 4,627,956, Cl. 376-272.000.
Transport Investment Corp.: *See—*
O'Neill, Hugh, 4,627,629, Cl. 280-5.00D.
Travers, Harry T.: *See—*
Vescio, Donald W.; and Travers, Harry T., 4,628,415, Cl. 362-61.000.
Treiber, Helmut: *See—*
Nitsch, Wilhelm; Treiber, Helmut; and Benker, Gerhard, 4,627,719, Cl. 355-41.000.
Trenkle, Robert W.: *See—*
Kiwala, Jacob; Mookherjee, Braja D.; and Trenkle, Robert W., 4,627,449, Cl. 131-276.000.
Trimm, Harold H.: *See—*
Jennings, Barry R.; Trimm, Harold H.; and Webb, Terence W., 4,627,727, Cl. 356-338.000.
Troponwerke GmbH & Co., KG: *See—*
Opitz, Wolfgang; Pelster, Bernhard; Fruchtmann, Romanis; Krupka, Udo; Gauss, Walter; Kiehne, Hartmut; and Oediger, Hermann, 4,628,062, Cl. 514-569.000.
Troscinski, Mark A., to Sundstrand Corporation. Rectifier assembly for mounting in a rotor. 4,628,219, Cl. 310-68.00D.
Troxell, Lillian H.: *See—*
Johnston, Howard; and Troxell, Lillian H., 4,628,099, Cl. 546-302.000.
Truswal Systems Corporation: *See—*
Bowser, Donald M., 4,627,564, Cl. 227-152.000.
TRW Cam Gears Limited: *See—*
Adams, Frederick J.; and Heap, Kenneth J. D., 4,627,509, Cl. 180-142.000.
Tseng, Kuo-yuan. Mobile garbage incinerator. 4,627,365, Cl. 110-240.000.
Tsuchihashi, Genichi; and Suzuki, Keisuke, to Toyo Stauffer Chemical Co., Ltd. Preparing method of optically active ketones. 4,628,120, Cl. 568-322.000.
Tsuchiya Co., Ltd.: *See—*
Nishida, Katsuhiko; Naruse, Tokio; and Shibata, Hiroshi, 4,627,283, Cl. 73-313.000.
Tsuchiya, Toshiaki: *See—*
Shimakata, Masashi; Kawamura, Katsuaki; Tsuchiya, Toshiaki; Shioya, Yuichiro; Inoue, Takao; Syoji, Mitsuo; and Kuroda, Keiichi, 4,628,537, Cl. 455-34.000.
Tsuk, Andrew G., to American Home Products Corporation. Storage-stable transdermal adhesive patch. 4,627,429, Cl. 128-156.000.
Tsuruo, Takashi: *See—*
Sakurai, Yoshio; and Tsuruo, Takashi, 4,628,047, Cl. 514-34.000.
Tsutiya, Yasuhiro: *See—*
Yamazawa, Yasushi; Tsutiya, Yasuhiro; Terada, Masaki; Aoki, Tosio; and Sato, Hiroyuki, 4,627,307, Cl. 74-552.000.
Tsuzuki, Mitsuo: *See—*
Suga, Michihisa; and Tsuzuki, Mitsuo, 4,628,330, Cl. 346-75.000.
Tucker, Richard O.: *See—*
Chen, Paul N., Sr.; and Tucker, Richard O., 4,628,067, Cl. 521-25.000.
Turits, Philip D.: *See—*
Gould, Peter J.; and Turits, Philip D., 4,627,936, Cl. 252-558.000.
Turmag-Turbo-Maschinen-Aktiengesellschaft Nuesse & Graefer: *See—*
Ebeling, Wolfgang, 4,627,501, Cl. 175-319.000.
Turner, Robert, to Johns Hopkins University, The. Method and apparatus using laser radiation for generating and measuring gas bubbles. 4,627,726, Cl. 356-336.000.
Tutco, Inc.: *See—*
Sherrill, Jimmy L., 4,628,190, Cl. 219-532.000.
Tutzer, Peter, to Dr. Ing h.c.F. Porsche AG. Intermediate differential for a vehicle including a spur gear/planetary gear arrangement. 4,627,513, Cl. 180-249.000.
Twerdochlib, Michael, to Westinghouse Electric Corp. Temperature measuring apparatus. 4,628,196, Cl. 250-225.000.
Tymes, LaRoy, to Excellon Industries. Method and apparatus for pattern forming. 4,628,466, Cl. 364-521.000.
Uarco Incorporated: *See—*
Welsch, Bernhard J., 4,627,994, Cl. 428-41.000.
Uchida, Sadao: *See—*
Mabuchi, Akira; Uchida, Sadao; and Ishikake, Masanao, 4,627,638, Cl. 280-779.000.
Uchida, Satoru: *See—*
Nagashwa, Takao; and Uchida, Satoru, 4,627,274, Cl. 73-64.000.
Uehara, Haruo; and Nakaoka, Tsutomu, to Saga University. Oceano-thermosteric power plant. 4,628,212, Cl. 290-54.000.

Uemura, Takeo: *See—*
Murakami, Shigeru; Komatsu, Yasuto; Watanabe, Makoto; and Uemura, Takeo, 4,627,944, Cl. 264-29.400.
Uggerud; Kristian. Bed tick with pocket for user's feet. 4,627,123, Cl. 5-485.000.
Uhrner, Horst: *See—*
Schwing, Ewald; Sommer, Peter; and Uhrner, Horst, 4,627,175, Cl. 34-57.00A.
Ulrich, Paul L.; Richards, James; and Tanke, Eugene T., II, to General Motors Corporation. Hand engine and brake control mechanism for a vehicle. 4,627,522, Cl. 192-35.000.
Ultimate Survivor of America Inc.: *See—*
Hruden, Wayne R., 4,628,014, Cl. 429-113.000.
Umehara, Hajime: *See—*
Imahashi, Hiromichi; Inagaki, Masahisa; Akahori, Kimihiko; and Umehara, Hajime, 4,627,148, Cl. 29-516.000.
Umehara, Hidetoshi: *See—*
Sawada, Katsuji; Kimijima, Yoshiaki; and Umehara, Hidetoshi, 4,627,412, Cl. 126-110.00B.
Umemoto, Masuo: *See—*
Mita, Seiichi; Izumita, Morishi; Umemoto, Masuo; Eto, Yoshizumi; Rokuda, Morito; and Kanada, Hidehiro, 4,628,297, Cl. 340-347.0DD.
Umemura, Shinichiro: *See—*
Ogawa, Toshio; Katakura, Kageyoshi; and Umemura, Shinichiro, 4,627,290, Cl. 73-628.000.
Takeuchi, Hiroshi; Nakaya, Chitose; Umemura, Shinichiro; and Katakura, Kageyoshi, 4,628,223, Cl. 310-358.000.
Umetsu, Junichi. Apparatus for producing polyacetylene film. 4,627,803, Cl. 425-6.000.
Umezawa, Kouji: *See—*
Takamatsu, Ryoji; Umezawa, Kouji; and Toyoguchi, Tsutomu, 4,628,498, Cl. 369-77.100.
Underdown, David R.: *See—*
Ashford, James D.; Harrison, Terry W.; Eastlack, James K.; Blount, Curtis G.; Herring, Gary D.; and Underdown, David R., 4,627,496, Cl. 166-292.000.
Union Carbide Corporation: *See—*
Bartley, William J., 4,628,128, Cl. 568-864.000.
Bartley, William J., 4,628,129, Cl. 568-864.000.
BeVier, William E.; Kather, Kenneth C.; and Graczyk, Lawrence S., 4,627,456, Cl. 137-1.000.
Gioffre, Anthony J.; and Ross, Ronald J., 4,627,972, Cl. 424-44.000.
Nausedas, Joseph A.; and Kazaitis, Michael P., 4,627,130, Cl. 17-1.00R.
Schaub, Herbert R., 4,627,243, Cl. 62-52.000.
Union Oil Company of California: *See—*
Ghandehari, Mohammad H., 4,627,898, Cl. 204-64.00R.
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Wilcke, Gerhard, to Berolina International Marketing Strategie GmbH. Toner refill container. 4,627,476, Cl. 141-364.000.
Wildt, Eberhard, to Robert Casaretto KG. Device for treating nonwovens. 4,627,137, Cl. 29-121.200.
Wilke, Raud A.; and Paik, Michael, to Husco International, Inc. Hydraulic control valve with manual override. 4,627,468, Cl. 137-625.660.
Wilkening, Hermann: *See*—
Loges, Hans J.; and Wilkening, Hermann, 4,627,258, Cl. 72-196.000.
Will, Fritz G.: *See*—
Niedrach, Leonard W.; and Will, Fritz G., 4,627,907, Cl. 204-415.000.
Willatts, Brian A.: *See*—
Carter, David E.; Bailey, Malcolm J.; and Willatts, Brian A., 4,627,662, Cl. 297-313.000.
Willhoft, Edward M. A. Cryogenic cooling. 4,627,244, Cl. 62-63.000.
Williams, Daniel W.: *See*—
Mikic, Frank; and Williams, Daniel W., 4,627,164, Cl. 30-135.000.
Williams, John T.: *See*—
August, Melvin C.; and Williams, John T., 4,628,407, Cl. 361-388.000.
Williams, Richard W.: *See*—
Johnson, David E.; and Williams, Richard W., 4,628,265, Cl. 324-329.000.
Williams, Theodore M. Fish stunning assembly. 4,627,187, Cl. 43-17.100.
Willis, Edwin: *See*—
Butterworth, Robert M.; Martin, John R.; and Willis, Edwin, 4,627,925, Cl. 252-8.800.
Wilson, Jolyon P., to International Standard Electric Corporation. Compensated Fabry Perot sensor. 4,627,728, Cl. 356-345.000.
Wilmes, Manfred: *See*—
Wiebe, Ulrich; and Wilmes, Manfred, 4,627,314, Cl. 81-9.430.
Wilson, Arthur C., to General Electric. Refrigerator compartment partition and method of assembly. 4,627,246, Cl. 62-286.000.
Wilson, Norman H.: *See*—
Jones, Robert L.; and Wilson, Norman H., 4,628,061, Cl. 514-469.000.
Windmoller & Holscher: *See*—
Tetenborg, Konrad, 4,628,535, Cl. 383-24.000.
Winkel, Jens; Klein, Gerhard; Meier, Helmut-Martin; Suling, Carlhans; and Arlt, Dieter, to Bayer Aktiengesellschaft. Amines, processes for their preparation and their use in compositions which can undergo free radical polymerization. 4,628,112, Cl. 560-160.000.
Winkelbauer, Howard M.; Wang, Ke-Chin; Walther, Frank H., Jr.; and Stock, Donald F., to Dresser Industries, Inc. Method of manufacturing an injection molded refractory shape and composition thereof. 4,627,945, Cl. 264-29.500.
Winney, Randy A., to Mobil Oil Corporation. Method of avoiding aliasing in slant stacking of seismic data. 4,628,492, Cl. 367-63.000.
Winter, Gerhard, to Schon & Cie. Geseiischaft mit beschrankter Haftung. Device for supporting the last on a toe lasting machine. 4,627,124, Cl. 12-12.400.
Winther, Howard A., to Royal Waterbeds, Inc. Damped waterbed mattress and method for manufacturing same. 4,627,121, Cl. 5-451.000.
Winthrop, Marilyn P. Nail polish removing apparatus. 4,627,758, Cl. 401-208.000.
Wise, Mahlon. Lathe, duplicating. 4,627,477, Cl. 142-7.000.
Wittes, James M., to Stiefel Laboratories, Inc. Sponge and fabrication method. 4,627,129, Cl. 15-244.00C.
Wittkower, Andrew, to Eaton Corporation. Particle implantation apparatus and method. 4,628,209, Cl. 250-492.200.
Wolf, Horst, to Zinser Textilmaschinen GmbH. Method of and apparatus for starting up individual working elements of a textile machine, e.g. a spinning machine. 4,627,228, Cl. 57-88.000.
Wombwell, Kenneth J.: *See*—
Thompson, Gordon L.; Gudgeon, Brian; and Wombwell, Kenneth J., 4,628,409, Cl. 361-403.000.
Wong, Patrick S. L.; and Theeuwes, Felix, to ALZA Corporation. Colonic-therapeutic delivery system. 4,627,851, Cl. 604-892.000.
Wood, David W.: *See*—
Baron, Kenneth S.; and Wood, David W., 4,627,424, Cl. 128-83.000.
Wormald International Ltd.: *See*—
Byrne, Barry F., 4,627,497, Cl. 169-23.000.
Worrell, Wayne L.; and Liu, Qing-Guo, to University Patents, Inc. Electrochemical sensors and methods for their manufacture and use. 4,627,892, Cl. 204-1.00T.
Wright, Bernard S.: *See*—
Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., 4,628,135, Cl. 585-331.000.
Wright, Brian L. Accessory for yachts. 4,627,374, Cl. 114-218.000.

Wright, Christopher R.: *See*—
Johnston, James S.; Holland, Leslie; and Wright, Christopher R., 4,627,902, Cl. 204-192.210.
Wright, Hubert A., to Cambridge Applied Systems, Inc. Viscometer. 4,627,272, Cl. 73-57.000.
Wruk, Philip J.: *See*—
Bardsley, Robert F.; Finucane, Thomas P.; Hebel, Carl; Schoonmaker, Charles D.; and Wruk, Philip J., 4,627,986, Cl. 426-112.000.
Wu, Tsun-Zong: *See*—
Okuda, Toshio; and Wu, Tsun-Zong, 4,627,455, Cl. 135-25.00A.
Wu, Zhiqion: *See*—
Pan, Jiluan; Zhang, Renhao; Ou, Zhiming; and Wu, Zhiqion, 4,628,181, Cl. 219-130.330.
Wusthof, Peter; Schneider, Johann; and Schulz, Ewald, to Mannesmann Rexroth GmbH. Rotary gear machine with commutator and shaft in flange housing. 4,627,801, Cl. 418-61.00B.
Wyer, Andrew F., to Xerox Corporation. Sheet curl control apparatus for a copier. 4,627,718, Cl. 355-35.00H.
Wykypiel, Werner: *See*—
Schweikert, Otto E.; Reimann, Walter; Wykypiel, Werner; and Mack, Karl E., 4,628,106, Cl. 548-440.000.
Xerox Corporation: *See*—
Goetz, Frank M., 4,627,710, Cl. 355-14.00R.
Lin, John W.; and Dudek, Lesley P., 4,628,018, Cl. 430-59.000.
Moore, Kenneth P., 4,627,606, Cl. 271-98.000.
Nguyen, Tuan A.; Sosinski, Ronald T.; and Buchar, Wayne A., 4,627,721, Cl. 355-77.000.
Roller, George J.; and Thomas, Kendolph A., 4,627,605, Cl. 271-94.000.
Schron, Steven M., 4,627,711, Cl. 355-14.0SH.
Thompson, Michael D.; and Imes, Clifford W., IV, 4,627,717, Cl. 355-15.000.
Wyer, Andrew F., 4,627,718, Cl. 355-35.00H.
Yada, Hideo; Akaba, Kunihisa; and Mukaiyama, Megumi, to Takeda Chemical Industries, Ltd., by said Hideo Yada; and Asahi-Matsu Foods Inc., by said Kunihisa Akaba and Megumi Mukaiyama. Processed soybean foods and their production. 4,627,985, Cl. 426-92.000.
Yagi, Masaru; Fujimoto, Nobuaki; and Hayashi, Yoshitoki, to Kitagawa Industries Co., Ltd.; and Kitagawa Industries Co., Ltd. Plate holder. 4,627,760, Cl. 403-201.000.
Yagi, Norio; and Nuita, Akira, to Tokyo Electric Co., Ltd. Daisy wheel printing device with variable hammer delay. 4,627,752, Cl. 400-144.200.
Yajima, Hiroshi, to Casio Computer Co., Ltd. Optical tracking robot system. 4,627,511, Cl. 180-167.000.
Yamabayashi, Yasunobu: *See*—
Kimoto, Sanshiro; Kokubo, Hisao; Yamabayashi, Yasunobu; and Hidejima, Kenichi, 4,628,260, Cl. 324-220.000.
Yamada, Jun: *See*—
Yamasaki, Masahiro; Wakabayashi, Masayoshi; Yamada, Jun; and Senga, Takao, 4,627,698, Cl. 354-317.000.
Yamada, Mitsuhiko, to Dainippon Screen Mfg. Co., Ltd. Picture scanning and recording method. 4,628,366, Cl. 358-280.000.
Yamagata, Akio: *See*—
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Yamaguchi, Hiroshi: *See*—
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Yamaguchi, Jun, to Sumitomo Electric Industries, Ltd. Mirror wafer of compound semiconductor. 4,628,016, Cl. 430-30.000.
Yamaguchi, Yoshio: *See*—
Moriyama, Masaru; and Yamaguchi, Yoshio, 4,627,755, Cl. 400-662.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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Yamakage, Tetsuro: *See*—
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Yamamoto, Atsuko: *See*—
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Yamamoto, Masayuki: *See*—
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Yamaoka, Shigemitsu: *See*—
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Yamasaki, Masahiro; Wakabayashi, Masayoshi; Yamada, Jun; and Senga, Takao, to Dainippon Screen Mfg. Co., Ltd. Processing apparatus for printing plates. 4,627,698, Cl. 354-317.000.
Yamashita, Kazuhisa: *See*—
Yoshida, Takeomi; Yamashita, Kazuhisa; and Miura, Yukio, 4,627,552, Cl. 222-14.000.
Yoshida, Takeomi; Yamashita, Kazuhisa; and Miura, Yukio, 4,627,553, Cl. 222-14.000.
Yamashita, Kazuyoshi: *See*—
Yokoe, Nobuo; Okawa, Takashi; Fujikawa, Nobuyoshi; and Yamashita, Kazuyoshi, 4,628,404, Cl. 361-321.000.
Yamashita, Masatsuga: *See*—
Bingo, Hideyuki; Yoshimura, Takashi; Yamashita, Masatsuga; Hashizume, Shinichi; and Iwakiri, Norio, 4,628,166, Cl. 200-302.100.
Yamashita, Ryozo: *See*—
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; Okumura, Takatoshi; and Morimoto, Minoru, 4,628,467, Cl. 364-521.000.
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Namiki, Kyoji; Abe, Shunji; Yamashita, Shigeki; and Kashiwaba, Yukio, 4,627,406, Cl. 123-573.000.
Yamato, Hideyuki: *See*—
Maeda, Yuji; Yamato, Hideyuki; Fujii, Takayoshi; Kobayashi, Yasuhiko; Saito, Kenichi; Kato, Tadaaki; and Yoshikumi, Chikao, 4,628,050, Cl. 514-167.000.
Yamawaki, Naokuni: *See*—
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Yamazaki, Hiroyuki: *See*—
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Yamazaki, Shigeru: *See*—
Takahashi, Hiroaki; Yamazaki, Shigeru; Noguchi, Takaharu; and Arai, Takao, 4,628,373, Cl. 360-62.000.
Yamazawa, Yasushi; Tsutiya, Yasuhiro; Terada, Masaki; Aoki, Tosio; and Sato, Hiroyuki, to Toyota Jidosha Kabushiki Kaisha. Fiber-reinforced plastic core material for steering wheels. 4,627,307, Cl. 74-552.000.
Yang, Ching-Shi: *See*—
Fredette, Maurice C. J.; and Yang, Ching-Shi, 4,627,969, Cl. 423-478.000.
Yang, John P. Electronic athlete trainer for improving skills in reflex, speed and accuracy. 4,627,620, Cl. 273-1.0GC.
Yang, Shiow-Shong: *See*—
Katkocin, Dennis M.; Zeman, Nancy W.; and Yang, Shiow-Shong, 4,628,028, Cl. 435-95.000.
Yarger, Ronald G.: *See*—
Barnett, Ronald E.; and Yarger, Ronald G., 4,627,987, Cl. 426-548.000.
Yasuda, Keiji; and Haneda, Hideo, to Aisin Seiki Kabushiki Kaisha. Temperature responsive switch. 4,628,295, Cl. 337-354.000.
Yasuda, Mamoru: *See*—
Nishimura, Takeji; and Yasuda, Mamoru, 4,628,521, Cl. 377-24.000.
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Yata, Shizukuni; and Hato, Yukinori, to Kanebo, Ltd. Insoluble and infusible substrate with a polyacene-type skeletal structure, and its applications for electrical conductor and organic cell. 4,628,015, Cl. 429-194.000.
Yatomi, Satoshi: *See*—
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Yazaki Corporation: *See*—
Kato, Shinichi; Watanabe, Kiyoto; Saito, Yoji; and Yamagata, Akio, 4,627,759, Cl. 403-2.000.
Yeakey, Ernest L.: *See*—
Sanderson, John R.; and Yeakey, Ernest L., 4,628,108, Cl. 549-453.000.
Yee, Alfred A., to Miyamoto, Hysao. Splice sleeve for reinforcing bars with cylindrical shell. 4,627,212, Cl. 52-726.000.
Yin-Lung, Yang: *See*—
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Yoko-team Oy: *See*—
Jarvinen, Jyrki H., 4,627,108, Cl. 2-22.000.
Yokoe, Nobuo; Okawa, Takashi; Fujikawa, Nobuyoshi; and Yamashita, Kazuyoshi, to Kyocera Corporation. Dielectric composition and laminated capacitor. 4,628,404, Cl. 361-321.000.
Yokooku, Katsuhiko; Seo, Nobuhide; Oda, Hiroyuki; Sumida, Shizuo; and Yatomi, Satoshi, to Mazda Motor Corporation. Automotive driving control system utilizing a stepless transmission. 4,627,311, Cl. 74-866.000.
Yokota, Tohru; Inoue, Kaname; Tanizawa, Ryozo; Asou, Hideyuki; and Kitamura, Hajime, to Shin Etsu Chemical Co., Ltd. Vinyl chloride resin-based composition for floppy disc jacket. 4,628,070, Cl. 524-504.000.
Yokoyama, Kiyoshi: *See*—
Mizutani, Michitaka; and Yokoyama, Kiyoshi, 4,628,039, Cl. 501-97.000.
Yonemori, Takaji; and Adachi, Hideki, to Canon Kabushiki Kaisha. Variable magnification image projector. 4,627,720, Cl. 355-57.000.
Yoshida Kogyo K.K.: *See*—
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Yoshida, Takashi: *See*—
Kamejima, Kohji; Hosoda, Yuji; Nakano, Yoshiyuki; Fujie, Masakatsu; Iwamoto, Taro; Honma, Kazuo; and Yoshida, Takashi, 4,628,453, Cl. 364-424.000.

Yoshida, Takeomi; Yamashita, Kazuhisa; and Miura, Yukio, to Tokico Ltd. Fuel supplying apparatus. 4,627,552, Cl. 222-14.000.

Yoshida, Takeomi; Yamashita, Kazuhisa; and Miura, Yukio, to Tokico Ltd. Fuel supplying apparatus having quantity and price preset switches. 4,627,553, Cl. 222-14.000.

Yoshida, Takumori, to Yamaha Hatsudoki Kabushiki Kaisha. Intake control system of engine. 4,627,396, Cl. 123-302.000.

Yoshida, Tatsuya; and Katada, Hiroshi, to Hitachi, Ltd. Load detecting apparatus and ignition control apparatus for internal combustion engines. 4,627,399, Cl. 123-419.000.

Yoshihisa, Sakamoto: *See*—
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Yoshikawa, Kiyomitsu: *See*—
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Yoshikumi, Chikao: *See*—
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Yoshimura, Takashi: *See*—
Bingo, Hideyuki; Yoshimura, Takashi; Yamashita, Masatsuga; Hashizume, Shinichi; and Iwakiri, Norio, 4,628,166, Cl. 200-302.100.

Yoshino, Hirobumi: *See*—
Tani, Tatsuo; Midorikawa, Akira; Ito, Masaji; Kuno, Masashi; Shinada, Masayuki; Yoshino, Hirobumi; and Nakashima, Yoshihiro, 4,627,707, Cl. 355-14.00R.

Yoshino, Motoaki: *See*—
Nozawa, Ryoichiro; Kiya, Nobuyuki; and Yoshino, Motoaki, 4,628,444, Cl. 364-188.000.

Yoshioka, Shigenari: *See*—
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Yoshioka, Yoshiaki: *See*—
Sasaki, Hideharu; Sawaki, Toru; and Yoshioka, Yoshiaki, 4,628,001, Cl. 428-367.000.

Yoshitomi Pharmaceutical Industries Ltd.: *See*—
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Young, Alastair J.: *See*—
Bainbridge, Wilfred N.; and Young, Alastair J., 4,627,301, Cl. 74-333.000.

Young, Joe W., to American Hospital Supply Corporation. Patient controlled analgesia conversion. 4,627,839, Cl. 604-121.000.

Young, Kenneth E.; Frohlich, Robert T.; Dudley, Hubert T.; and Hallock, Robert L., Jr., to W. R. Grace & Co.; and E.S. Products Co. Fastener for securing roofing material to cementitious roof decks having removable tab. 4,627,207, Cl. 52-361.000.

Young, Niels O. Homopolar motor with pressurized liquid metal contact. 4,628,221, Cl. 310-178.000.

Young, Robert W.: *See*—
Walton, Richard R.; Walton, Richard C.; Munchbach, George E.; and Young, Robert W., 4,627,849, Cl. 604-379.000.

Yu, Ruey J.; and Martino, William L., Jr., to Motorola, Inc. Clock signal test circuit. 4,628,253, Cl. 324-73.00R.

Yuasa Battery Co., Ltd.: *See*—
Kagawa, Hiroshi, 4,627,996, Cl. 428-104.000.

Yui, Katsufumi, to E.D.M. Corporation. Heated sleeve printing roll couple with clutch-brake unit control. 4,627,342, Cl. 101-25.000.

Yuki, Yoichi, to Daicel Chemical Industries, Ltd. Resolving agent. 4,627,919, Cl. 210-656.000.

Zafred, Paolo R.; and Veronesi, Luciano, to Westinghouse Electric Corp. Remote center compliance device. 4,627,169, Cl. 33-169.00C.

Zambon S.p.A.: *See*—
Meneghin, Mariano, 4,628,087, Cl. 544-41.000.

Zardiackas, Fredrick L., to Tandem Computers Incorporated. Vector interrupt system and method. 4,628,449, Cl. 364-200.000.

Zborovsky, Ilya: *See*—
Sherman, Victor; Zborovsky, Ilya; and Sanchez, William, 4,627,335, Cl. 99-325.000.

Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, to Bayer Aktiengesellschaft. Polyamide imides produced from either lactams or polyamides with isocyanates or anhydrides in which products are precipitated with a non-solvent. 4,628,079, Cl. 528-49.000.

Zeikus, Joseph G.; and Hyun, Hyung-Hwan, to Michigan Biotechnology Institute. Thermostable starch converting enzymes. 4,628,031, Cl. 435-205.000.

Zeiser, Manfred P.: *See*—
Kreylos, Hans-Albert; and Zeiser, Manfred P., 4,627,136, Cl. 29-160.600.

Zeman, Nancy W.: *See*—
Katkocin, Dennis M.; Zeman, Nancy W.; and Yang, Shiow-Shong, 4,628,028, Cl. 435-95.000.

Zenith Electronics Corporation: *See*—
Borg, Arthur N.; and Bar-Hai, Giora, 4,628,479, Cl. 364-900.000.
Campisi, Carl; Lev, Abraham; and Schmid, Richard G., 4,627,157, Cl. 29-741.000.
Ensinger, James W., 4,628,348, Cl. 358-39.000.
Midland, Richard W., 4,628,349, Cl. 358-67.000.

Zeorlin, Daniel H., to Boeing Company, The. Stowage receiver for fixed length rod. 4,627,590, Cl. 248-351.000.

Zepter, Karl H.; Opitz, Dieter; Roeder, Alfred; and Chmiel, Max, to Dolomitwerke GmbH. Method of manufacturing a sintered dolomite in a shaft kiln. 4,627,948, Cl. 264-56.000.

Zhang, Renhao: *See*—
Pan, Jiluan; Zhang, Renhao; Ou, Zhiming; and Wu, Zhiqion, 4,628,181, Cl. 219-130.330.

Ziegler, John H.: *See*—
Daniels, John A.; and Ziegler, John H., 4,627,657, Cl. 296-91.000.

Zils, James A.: *See*—
Pamer, W. Richard; and Zils, James A., 4,627,776, Cl. 411-179.000.

Zinger, William H.; and Krill, Jerry A., to Johns Hopkins University, The. Multiport rectangular TE_{10} to circular TE_{01} mode transducer having pyrimidal shaped transducing means. 4,628,287, Cl. 333-137.000.

Zinser Textilmaschinen GmbH: *See*—
Wolf, Horst, 4,627,228, Cl. 57-88.000.

ZNIKA: *See*—
Marvakov, Ivan K.; and Russev, Todor Y., 4,628,427, Cl. 363-27.000.

Zondler, Helmut: *See*—
Schmid, Rolf; Zondler, Helmut; Fischer, Michael; and Stauffer, Werner, 4,628,105, Cl. 548-341.000.

Zoonens, Alain. Davit device. 4,627,377, Cl. 114-373.000.

Zunkel, Gary D., to Halliburton Company. Well packer. 4,627,491, Cl. 166-126.000.

Zupancic, Joseph J.; and Swedo, Raymond J., to Allied Corporation. Facilitated gas enrichment membrane composites and a process for the preparation thereof. 4,627,859, Cl. 55-158.000.

Zwosta, Helge. Method and instrument for generating acoustic and/or visual effects by human body actions. 4,627,324, Cl. 84-1.010.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF DECEMBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Almond, Stephen W.; and Harris, Phillip C., to Halliburton Company. Fracturing method for stimulation of wells utilizing carbon dioxide based fluids. Re. 32,302, Cl. 166-308.000.

American Medical Products Corp.: *See—*
Lasker, Norman; and Jarrell, Bruce E., Re. 32,303, Cl. 604-29.000.

Bianchi, Valerio: *See—*
Latsch, Reinhard; and Bianchi, Valerio, Re. 32,301, Cl. 123-440.000.

Halliburton Company: *See—*
Almond, Stephen W.; and Harris, Phillip C., Re. 32,302, Cl. 166-308.000.

Harris, Phillip C.: *See—*
Almond, Stephen W.; and Harris, Phillip C., Re. 32,302, Cl. 166-308.000.

Jarrell, Bruce E.: *See—*
Lasker, Norman; and Jarrell, Bruce E., Re. 32,303, Cl. 604-29.000.

Lasker, Norman; and Jarrell, Bruce E., to American Medical Products Corp. Peritoneal dialysis apparatus. Re. 32,303, Cl. 604-29.000.

Latsch, Reinhard; and Bianchi, Valerio, to Robert Bosch GmbH. Method and apparatus for controlling the composition of the combustible mixture of an engine. Re. 32,301, Cl. 123-440.000.

Robert Bosch GmbH: *See—*
Latsch, Reinhard; and Bianchi, Valerio, Re. 32,301, Cl. 123-440.000.

LIST OF DESIGN PATENTEES

Aavid Engineering, Inc.: *See—*
McCarthy, Alfred F., 287,120, Cl. D13-23.000.
McCarthy, Alfred F., 287,121, Cl. D13-23.000.

Abe, Ryouichi: *See—*
Saiki, Tsukasa; Kajima, Nobuyuki; Abe, Ryouichi; and Hujiwara, Tatsuo, 287,117, Cl. D13-12.000.

Accurist S.A.: *See—*
Levene, Maurice, 287,108, Cl. D11-4.000.
Levene, Maurice, 287,109, Cl. D11-4.000.

Adams, Peter G., to Hestair Kiddicraft Limited. Rattle. 287,148, 12-9-86, Cl. D21-65.000.

Akiyama, Kunio: *See—*
Sugiyama, Masakazu; and Akiyama, Kunio, 287,138, Cl. D18-1.000.

Albertini, Rocco D., to Baldt Incorporated. Separable chain link. 287,102, 12-9-86, Cl. D8-499.000.

Anderson, Henry P. Gun butt plate. 287,158, 12-9-86, Cl. D22-111.000.

Austin, Arnold S., to Quabaug Corporation. Shoe sole. 287,065, 12-9-86, Cl. D2-320.000.

Austin, Arnold S., to Quabaug Corporation. Shoe heel. 287,066, 12-9-86, Cl. D2-323.000.

Avicom International, Inc.: *See—*
Shilton, Albert R.; and DeSmet, Greg L., 287,145, Cl. D21-13.000.

B.W.B. Controls, Inc.: *See—*
Bergeron, Ned; and Stollberg, Theodore A., 287,107, Cl. D10-121.000.

Babb, Larry F.; and Boise, Charles A., to Emerson Electric Co. Cart for a drain cleaning machine. 287,178, 12-9-86, Cl. D34-24.000.

Baldt Incorporated: *See—*
Albertini, Rocco D., 287,102, Cl. D8-499.000.

Bates Manufacturing Company, The: *See—*
Staubitz, Robert; and Leszczak, John, 287,070, Cl. D3-35.000.

Baumgartner, Robert: *See—*
Kingsford, Ted; Baumgartner, Robert; and Rose, Sheila, 287,168, Cl. D28-77.000.

Becker, Peter, to Krone GmbH. Handset telephone and stand unit. 287,124, 12-9-86, Cl. D14-53.000.

Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., to Shop-Vac Corporation. Motor housing for canister type electric vacuum cleaner. 287,171, 12-9-86, Cl. D32-25.000.

Bergeron, Ned; and Stollberg, Theodore A., to B.W.B. Controls, Inc. Indicator lens. 287,107, 12-9-86, Cl. D10-121.000.

Blue Box Toy Factory Limited: *See—*
Choi, Tzi-Chan, 287,153, Cl. D21-150.000.

Boise, Charles A.: *See—*
Babb, Larry F.; and Boise, Charles A., 287,178, Cl. D34-24.000.

Bound, Patrick S. Combined helmet and beverage container supports. 287,061, 12-9-86, Cl. D2-246.000.

Bounds, William E. Condiment mill. 287,088, 12-9-86, Cl. D7-53.000.

Bowsher, Robert L. Shoe rack. 287,078, 12-9-86, Cl. D6-450.000.

Bushman, James A., to St. Louis Music Supply Company. Musical instrument string adjuster. 287,137, 12-9-86, Cl. D17-20.000.

Bussell, Linda D. Animal figure. 287,152, 12-9-86, Cl. D21-148.000.

Catania, Hilda B., co-executor: *See—*
Catania, Joseph J., deceased; Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,167, Cl. D23-138.300.

Catania, Joseph J., deceased (by Catania, Hilda B., co-executor); Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, to Century Fireplace Furnishings, Inc. Fireplace screen. 287,167, 12-9-86, Cl. D23-138.300.

Century Fireplace Furnishings, Inc.: *See—*
Catania, Joseph J., deceased; Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,167, Cl. D23-138.300.

Cesaroni, William C., to Dart Industries Inc. Electric beverage maker. 287,089, 12-9-86, Cl. D7-309.000.

Chalabian, Jack S., to K-Jack Engineering Company, Inc. Newspaper vending machine. 287,143, 12-9-86, Cl. D20-6.000.

Charleswood Furniture Corp.: *See—*
Gambon, Thomas F., 287,082, Cl. D6-491.000.

Choi, Tzi-Chan, to Blue Box Toy Factory Limited. Toy scuba figure. 287,153, 12-9-86, Cl. D21-150.000.

Clapp, Dorine M. Deck of playing cards. 287,147, 12-9-86, Cl. D21-43.000.

Colin, George M.; and Patterson, Bettie L., to Colin, George M. Combined shower stall foot stool and storage compartment. 287,075, 12-9-86, Cl. D6-349.000.

Conn. National Bank, co-executor: *See—*
Catania, Joseph J., deceased; Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,167, Cl. D23-138.300.

Cory, Milton T., to Radiator Specialty Company. Elastic tie down strap. 287,099, 12-9-86, Cl. D8-394.000.

Crevling, Robert L., Jr.: *See—*
Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., 287,171, Cl. D32-25.000.

Dale, John D.: *See—*
Lipsky, Steven J.; and Dale, John D., 287,165, Cl. D24-51.000.
Lipsky, Steven J.; and Dale, John D., 287,166, Cl. D24-51.000.

Dart Industries Inc.: *See—*
Cesaroni, William C., 287,089, Cl. D7-309.000.

Densen, Mark. Storage cabinet. 287,080, 12-9-86, Cl. D6-446.000.

de Sanson, Carmen C. C. Doll or similar article. 287,154, 12-9-86, Cl. D21-166.000.

DeSmet, Greg L.: *See—*
Shilton, Albert R.; and DeSmet, Greg L., 287,145, Cl. D21-13.000.

DeTuzzi, Russell: *See—*
Catania, Joseph J., deceased; Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,167, Cl. D23-138.300.

DiFede, John. Bucket mountable mop hanger. 287,174, 12-9-86, Cl. D32-54.000.

Dunn, Matthew G. Dart game board. 287,144, 12-9-86, Cl. D21-6.000.

Durand, Jean-Jacques. Frying pan or similar article. 287,092, 12-9-86, Cl. D7-361.000.

Egly, Robert A.; and Sullivan, Patrick. Magnetic disk storage case. 287,069, 12-9-86, Cl. D3-35.000.

Elliston, Murray L. Barbecue. 287,091, 12-9-86, Cl. D7-337.000.

Emerson Electric Co.: *See—*
Babb, Larry F.; and Boise, Charles A., 287,178, Cl. D34-24.000.

Envall, Bjorn E. A.; and Wardle, Geoffrey P., to Saab-Scania Aktiebolag. Left rear shield for attachment to an automobile. 287,115, 12-9-86, Cl. D12-190.000.

Envall, Bjorn E. A.; and Wardle, Geoffrey P., to Saab-Scania Aktiebolag. Left front shield for attachment to an automobile. 287,116, 12-9-86, Cl. D12-190.000.

Etablissements Regnault: *See—*
Regnault, Pierre, 287,141, Cl. D19-43.000.

F.I.R. Rubinetterie S.p.A.: *See—*
Piesco, Nazzareno, 287,161, Cl. D23-28.000.

Piesco, Nazzareno, 287,162, Cl. D23-28.000.
Piesco, Nazzareno, 287,163, Cl. D23-28.000.
Piesco, Nazzareno, 287,164, Cl. D23-29.000.
FitzGerald, Joseph M., to Superbus Associates. Passenger semitrailer. 287,113, 12-9-86, Cl. D12-97.000.
Forbes, William A. Blade for soil mixer. 287,132, 12-9-86, Cl. D15-19.000.
Fratelli Guzzini S.p.A.: *See*—
Gecchelin, Bruno, 287,175, Cl. D32-55.000.
Fulanovich, Jo Ann. Squeegee. 287,172, 12-9-86, Cl. D32-41.000.
Galloway Plastics Incorporated: *See*—
Meier, James L.; and Galloway, Scott F., 287,086, Cl. D7-9.000.
Galloway, Scott F.: *See*—
Meier, James L.; and Galloway, Scott F., 287,086, Cl. D7-9.000.
Gambon, Thomas F., to Charleswood Furniture Corp. Molding for furniture. 287,082, 12-9-86, Cl. D6-491.000.
Gardner, Maxwell: *See*—
Catania, Joseph J., deceased; Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,167, Cl. D23-138.300.
Gaudino, Angelo: *See*—
Catania, Joseph J., deceased; Conn. National Bank, co-executor; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 287,167, Cl. D23-138.300.
Gecchelin, Bruno, to Fratelli Guzzini S.p.A. Cutlery drainer. 287,175, 12-9-86, Cl. D32-55.000.
Goldeneye Products, Inc.: *See*—
Nelson, Bruce D., 287,097, Cl. D8-382.000.
Goldman, Charles R. Memorandum reminding device. 287,142, 12-9-86, Cl. D19-75.000.
Goldman, Jerome; Goldman, Marvin; Phillips, Gerald; and Pesin, Joseph, to Penn Plax Plastics, Inc. Automatic aquarium feeder. 287,170, 12-9-86, Cl. D30-12.000.
Goldman, Marvin: *See*—
Goldman, Jerome; Goldman, Marvin; Phillips, Gerald; and Pesin, Joseph, 287,170, Cl. D30-12.000.
Great Neck Saw Manufacturers, Inc.: *See*—
Jacoff, Richard, 287,094, Cl. D8-49.000.
Grilliot, Mary I.: *See*—
Grilliot, William L.; and Grilliot, Mary I., 287,060, Cl. D2-187.000.
Grilliot, William L.; and Grilliot, Mary I. Firefighter's jacket. 287,060, 12-9-86, Cl. D2-187.000.
Griz, Peter R. Mouth-touching bowstring-held anchor nock for archery. 287,157, 12-9-86, Cl. D22-107.000.
Grun, Otto. Aquatic sculpture or similar article. 287,110, 12-9-86, Cl. D11-158.000.
Hancock, Howard N. Crocheted western hat. 287,062, 12-9-86, Cl. D2-258.000.
Hart, Leo, to Sanbree Corporation. Child's rocker cradle or similar article. 287,076, 12-9-86, Cl. D6-386.000.
Hart, Leo, to Sanbree Corporation. Baby rocking cradle. 287,077, 12-9-86, Cl. D6-390.000.
Hayashi, Shigeaki, to Sharp Corporation. Calculator. 287,139, 12-9-86, Cl. D18-7.000.
Helinsky, Jonathan. Rotatable dispenser for babies' diapers and toiletry. 287,081, 12-9-86, Cl. D6-457.000.
Herpel, Donald R. Side fairing. 287,114, 12-9-86, Cl. D12-181.000.
Herrick, Gregory E. Goblet retainer insert for a serving tray. 287,087, 12-9-86, Cl. D7-39.000.
Hestair Kiddicraft Limited: *See*—
Adams, Peter G., 287,148, Cl. D21-65.000.
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 287,149, Cl. D21-65.000.
Hitachi, Ltd.: *See*—
Saiki, Tsukasa; Kajima, Nobuyuki; Abe, Ryouichi; and Hujiwara, Tatsuo, 287,117, Cl. D13-12.000.
Holden, M. James, to Mobil Oil Corporation. Packaging tray. 287,104, 12-9-86, Cl. D9-425.000.
Hollister, Brent R. Adapter for camera flash strobe. 287,122, 12-9-86, Cl. D13-25.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Kuniyuki, 287,128, Cl. D15-1.000.
Hujiwara, Tatsuo: *See*—
Saiki, Tsukasa; Kajima, Nobuyuki; Abe, Ryouichi; and Hujiwara, Tatsuo, 287,117, Cl. D13-12.000.
Hunter, James P., to Kaman Sciences Corporation. Sharpening stone holder. 287,095, 12-9-86, Cl. D8-91.000.
Iida, Rikiya: *See*—
Nagatani, Ryoji; and Iida, Rikiya, 287,135, Cl. D15-144.000.
Innovative Concepts, Inc.: *See*—
Long, Jerry M.; and Womack, James A., 287,068, Cl. D3-35.000.
Iskra-Sozd Electrokovinske Industrije N.Sol.O.: *See*—
Savnik, Davorin, 287,125, Cl. D14-55.000.
Jacobs, Mark C. Computer table storage compartment. 287,084, 12-9-86, Cl. D6-510.000.
Jacoff, Richard, to Great Neck Saw Manufacturers, Inc. Staple gun or similar article. 287,094, 12-9-86, Cl. D8-49.000.
Jobe, Howard L. Golf bag accessory. 287,071, 12-9-86, Cl. D3-37.000.
John Manufacturing Ltd.: *See*—
Yuen, John S., 287,126, Cl. D14-57.000.
John Manufacturing Lmtd.: *See*—
Yuen, John S., 287,127, Cl. D14-57.000.
K-Jack Engineering Company, Inc.: *See*—
Chalabian, Jack S., 287,143, Cl. D20-6.000.
Kajima, Nobuyuki: *See*—
Saiki, Tsukasa; Kajima, Nobuyuki; Abe, Ryouichi; and Hujiwara, Tatsuo, 287,117, Cl. D13-12.000.
Kaman Sciences Corporation: *See*—
Hunter, James P., 287,095, Cl. D8-91.000.
Kasai, Kazumi, to Nippon Notion Kogyo Co. Ltd. Belt adjuster. 287,067, 12-9-86, Cl. D11-218.000.
Kingsford, Ted; Baumgartner, Robert; and Rose, Sheila, to Plough, Inc. Mascara applicator bottle. 287,168, 12-9-86, Cl. D28-77.000.
Kohno, Noboru, to Mizuno Corporation. Side panel for a shoe. 287,063, 12-9-86, Cl. D2-314.000.
Kouwenhoven, Josephus N. M. Collecting container for waste materials. 287,176, 12-9-86, Cl. D34-9.000.
Krone GmbH: *See*—
Becker, Peter, 287,124, Cl. D14-53.000.
Kuykendall, Roy E. Lug wrench support stand or similar article. 287,179, 12-9-86, Cl. D34-31.000.
Lappartient, Philippe. Pot-type malaxator. 287,134, 12-9-86, Cl. D15-122.000.
Leeds, Douglas B., to Thomson-Leeds Company, Inc. Floor mat hanger. 287,085, 12-9-86, Cl. D6-513.000.
Legueu, Paul. Bus vehicle. 287,112, 12-9-86, Cl. D12-84.000.
Leszczak, John: *See*—
Staubitz, Robert; and Leszczak, John, 287,070, Cl. D3-35.000.
Levene, Maurice, to Accurist S.A. Watch bracelet. 287,108, 12-9-86, Cl. D11-4.000.
Levene, Maurice, to Accurist S.A. Watch bracelet. 287,109, 12-9-86, Cl. D11-4.000.
Libman Broom Company: *See*—
Libman, Robert J., 287,173, Cl. D32-51.000.
Libman, Robert J., to Libman Broom Company. Liquid applicator. 287,173, 12-9-86, Cl. D32-51.000.
Lin, Tsung-Tzu. Combined rollable chessboards cloth and zippered cover therefor. 287,146, 12-9-86, Cl. D21-24.000.
Lipsky, Steven J.; and Dale, John D. Surgical suction device. 287,165, 12-9-86, Cl. D24-51.000.
Lipsky, Steven J.; and Dale, John D. Tip guard for a surgical suction device. 287,166, 12-9-86, Cl. D24-51.000.
Long, Jerry M.; and Womack, James A., to Innovative Concepts, Inc. Diskette storage container for floppy diskettes. 287,068, 12-9-86, Cl. D3-35.000.
Macedonio, Daniel F. Collapsible head rest. 287,083, 12-9-86, Cl. D6-502.000.
MacKarvich, Charles J.: *See*—
Wilson, Richard C.; and MacKarvich, Charles J., 287,098, Cl. D8-388.000.
Matsuda, Takashi, to Takara Co., Ltd. Reconfigurable insect toy. 287,155, 12-9-86, Cl. D21-185.000.
McCarthy, Alfred F., to Aavid Engineering, Inc. Electronic chip-carrier heat sink. 287,120, 12-9-86, Cl. D13-23.000.
McCarthy, Alfred F., to Aavid Engineering, Inc. Sheet-metal heat sink for electronic devices. 287,121, 12-9-86, Cl. D13-23.000.
Meier, James L.; and Galloway, Scott F., to Galloway Plastics Incorporated. Drinking mug. 287,086, 12-9-86, Cl. D7-9.000.
Meland, Ronald F.: *See*—
Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., 287,171, Cl. D32-25.000.
Meubelfabrieken Karel Mintjens N. V.: *See*—
Mintjens, Jules E., 287,079, Cl. D6-436.000.
Mintjens, Jules E., to Meubelfabrieken Karel Mintjens N. V. Modular storage unit. 287,079, 12-9-86, Cl. D6-436.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Nagatani, Ryoji; and Iida, Rikiya, 287,135, Cl. D15-144.000.
Mizuno Corporation: *See*—
Kohno, Noboru, 287,063, Cl. D2-314.000.
Mobil Oil Corporation: *See*—
Holden, M. James, 287,104, Cl. D9-425.000.
Moreau, Claude R. M. Simulative toy vehicle. 287,150, 12-9-86, Cl. D21-128.000.
Murray, Joseph E., Jr. Telescope. 287,136, 12-9-86, Cl. D16-132.000.
Nagatani, Ryoji; and Iida, Rikiya, to Mitsubishi Denki Kabushiki Kaisha. Welding robot. 287,135, 12-9-86, Cl. D15-144.000.
Nakamura, Kazuharu, to Toyotomi Kogyo Co., Ltd. Lawn mower. 287,131, 12-9-86, Cl. D15-16.000.
Nelson, Bruce D., to Goldeneye Products, Inc. Cleat. 287,097, 12-9-86, Cl. D8-382.000.
Nippon Notion Kogyo Co. Ltd.: *See*—
Kasai, Kazumi, 287,067, Cl. D11-218.000.
Ohno, Kouzin, to Takara Co., Ltd. Reconfigurable dinosaurian toy. 287,151, 12-9-86, Cl. D21-148.000.
Oki Electric Industry Co., Ltd.: *See*—
Yoshida, Kazuo, 287,140, Cl. D18-12.000.
Osterhout, Ralph F., to Tekna. Combined packaging and display container. 287,105, 12-9-86, Cl. D9-415.000.
Owen, Roger W. Refrigerator. 287,133, 12-9-86, Cl. D15-81.000.
Pape, John A.: *See*—
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 287,149, Cl. D21-65.000.
Partex Fabriksaktiebolag: *See*—
Skarin, Lars, 287,118, Cl. D13-13.000.
Patterson, Bettie L.: *See*—
Colin, George M.; and Patterson, Bettie L., 287,075, Cl. D6-349.000.
Penn Plax Plastics, Inc.: *See*—
Goldman, Jerome; Goldman, Marvin; Phillips, Gerald; and Pesin, Joseph, 287,170, Cl. D30-12.000.

Pesin, Joseph: *See*—
Goldman, Jerome; Goldman, Marvin; Phillips, Gerald; and Pesin, Joseph, 287,170, Cl. D30-12.000.

Pet Incorporated: *See*—
Wells, Harold D., 287,090, Cl. D7-323.000.

Pfleger, Anthony. Toothbrush. 287,072, 12-9-86, Cl. D4-104.000.

Phillips, Gerald: *See*—
Goldman, Jerome; Goldman, Marvin; Phillips, Gerald; and Pesin, Joseph, 287,170, Cl. D30-12.000.

Piesco, Nazzareno, to F.I.R. Rubinetterie S.p.A. Faucet handle. 287,161, 12-9-86, Cl. D23-28.000.

Piesco, Nazzareno, to F.I.R. Rubinetterie S.p.A. Faucet handle. 287,162, 12-9-86, Cl. D23-28.000.

Piesco, Nazzareno, to F.I.R. Rubinetterie S.p.A. Faucet handle. 287,163, 12-9-86, Cl. D23-28.000.

Piesco, Nazzareno, to F.I.R. Rubinetterie S.p.A. Faucet handle. 287,164, 12-9-86, Cl. D23-29.000.

Planhorse International NZ Limited: *See*—
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Plough, Inc.: *See*—
Kingsford, Ted; Baumgartner, Robert; and Rose, Sheila, 287,168, Cl. D28-77.000.

Purhonen, Matti, to Temet Oy. Valve for equalizing pressure resulting from explosions or blasts. 287,159, 12-9-86, Cl. D23-21.000.

Quabaug Corporation: *See*—
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Austin, Arnold S., 287,066, Cl. D2-323.000.

Rademacher, Manfred. Pair of faucet handles and spout set. 287,160, 12-9-86, Cl. D23-25.000.

Radiator Specialty Company: *See*—
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Raffo, David M.: *See*—
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 287,149, Cl. D21-65.000.

Regent Sports Corporation: *See*—
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Regnault, Pierre, to Etablissements Regnault. Writing instrument. 287,141, 12-9-86, Cl. D19-43.000.

Ritch Engineering Pty. Ltd.: *See*—
Ritchie, Daryl G., 287,074, Cl. D6-330.000.

Ritchie, Daryl G., to Ritch Engineering Pty. Ltd. Kneeling frame or similar article. 287,074, 12-9-86, Cl. D6-330.000.

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Kingsford, Ted; Baumgartner, Robert; and Rose, Sheila, 287,168, Cl. D28-77.000.

Ross, Saralee F.; and Rydbeck, James R. Electrical flat connector. 287,123, 12-9-86, Cl. D13-29.000.

Ryan, Robert B. Combined bottle cap remover, can opener and ice scraper. 287,093, 12-9-86, Cl. D8-34.000.

Rydbeck, James R.: *See*—
Ross, Saralee F.; and Rydbeck, James R., 287,123, Cl. D13-29.000.

Saab-Scania Aktiebolag: *See*—
Envall, Bjorn E. A.; and Wardle, Geoffrey P., 287,115, Cl. D12-190.000.
Envall, Bjorn E. A.; and Wardle, Geoffrey P., 287,116, Cl. D12-190.000.

Saiki, Tsukasa; Kajima, Nobuyuki; Abe, Ryouichi; and Hujiwara, Tatsuo, to Hitachi, Ltd. Programmable controller. 287,117, 12-9-86, Cl. D13-12.000.

St. Louis Music Supply Company: *See*—
Bushman, James A., 287,137, Cl. D17-20.000.

Sanbree Corporation: *See*—
Hart, Leo, 287,076, Cl. D6-386.000.
Hart, Leo, 287,077, Cl. D6-390.000.

Saunders, Charles A., IV. Clip connector for windscreen extensions or the like. 287,100, 12-9-86, Cl. D8-395.000.

Saunders, Charles A., IV. Clip connector for windscreen extensions or the like. 287,101, 12-9-86, Cl. D8-395.000.

Savnik, Davorin, to Iskra-Sozd Electrokovinske Industrije N.Sol.O. Coin-operated telephone apparatus. 287,125, 12-9-86, Cl. D14-55.000.

Schnuck, Marilyn A. Detachable ornament for footwear. 287,064, 12-9-86, Cl. D2-315.000.

Sharp Corporation: *See*—
Hayashi, Shigeaki, 287,139, Cl. D18-7.000.
Sugiyama, Masakazu; and Akiyama, Kunio, 287,138, Cl. D18-1.000.

Shilton, Albert R.; and DeSmet, Greg L., to Avicom International, Inc. Case for a portable computer game or similar device. 287,145, 12-9-86, Cl. D21-13.000.

Shop-Vac Corporation: *See*—
Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., 287,171, Cl. D32-25.000.

Skarin, Lars, to Partex Fabriksaktiebolag. Marking sleeve for electrical conductors or the like. 287,118, 12-9-86, Cl. D13-13.000.

Sloane, Leo, to Regent Sports Corporation. Stake. 287,156, 12-9-86, Cl. D21-255.000.

Societe d'Etudes de Chimie et de Therapie Appliques-Laboratoires de Cosmetologie Yves Rocher-S.E.C.T.A.: *See*—
Thieffry, Francois, 287,103, Cl. D9-352.000.

Spicer, Victor R., to Planhorse International NZ Limited. Cart. 287,177, 12-9-86, Cl. D34-21.000.

Staubitz, Robert; and Leszczak, John, to Bates Manufacturing Company, The. Disk holder. 287,070, 12-9-86, Cl. D3-35.000.

Stollberg, Theodore A.: *See*—
Bergeron, Ned; and Stollberg, Theodore A., 287,107, Cl. D10-121.000.

Sugiyama, Masakazu; and Akiyama, Kunio, to Sharp Corporation. Typewriter. 287,138, 12-9-86, Cl. D18-1.000.

Sullivan, Patrick: *See*—
Egly, Robert A.; and Sullivan, Patrick, 287,069, Cl. D3-35.000.

Superbus Associates: *See*—
FitzGerald, Joseph M., 287,113, Cl. D12-97.000.

Takara Co., Ltd.: *See*—
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Tekna: *See*—
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Temet Oy: *See*—
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Thieffry, Francois, to Societe d'Etudes de Chimie et de Therapie Appliques-Laboratoires de Cosmetologie Yves Rocher-S.E.C.T.A. Bottle or the like. 287,103, 12-9-86, Cl. D9-352.000.

Thompson, Paul H. Toothbrush. 287,073, 12-9-86, Cl. D4-105.000.

Thomson, Harry S.; Raffo, David M.; and Pape, John A., to Hestair Kiddicraft Limited. Toy Rattle. 287,149, 12-9-86, Cl. D21-65.000.

Thomson-Leeds Company, Inc.: *See*—
Leeds, Douglas B., 287,085, Cl. D6-513.000.

Tie Down Engineering, Inc.: *See*—
Wilson, Richard C.; and MacKarvich, Charles J., 287,098, Cl. D8-388.000.

Tilton Engineering, Inc.: *See*—
Tilton, McLane, Jr., 287,129, Cl. D15-5.000.
Tilton, McLane, Jr., 287,130, Cl. D15-5.000.

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CLASSIFICATION OF PATENTS

ISSUED DECEMBER 9, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

22	4,627,108
44	4,627,109
69	4,627,110
	4,627,111
81	4,627,112
144	4,627,113
414	4,627,114
425	4,627,115

CLASS 4

111.6	4,627,116
247	4,627,117
510	4,627,118

CLASS 5

83	4,627,119
201	4,627,120
451	4,627,121
484	4,627,122
485	4,627,123

CLASS 12

12.4	4,627,124

CLASS 15

105	4,627,125
	4,627,126
179	4,627,127
236 R	4,627,128
244 C	4,627,129

CLASS 17

1 R	4,627,130

CLASS 19

97	4,627,131

CLASS 24

169	4,627,132
298	4,627,133
687	4,627,134

CLASS 26

3	4,627,135

CLASS 29

25.35	4,627,138
25.42	4,627,139
121.2	4,627,137
160.6	4,627,136
264	4,627,140
275	4,627,141
283.5	4,627,142
434	4,627,143
447	4,627,144
450	4,627,145
458	4,627,146
515	4,627,147
516	4,627,148
	4,627,149
566.4	4,627,150
569 R	4,627,151
571	4,627,152
	4,627,153
623.1	4,627,154
726	4,627,155
740	4,627,156
741	4,627,157
771	4,627,158
827	4,627,159
830	4,627,160
838	4,627,161
847	4,627,162

CLASS 30

95	4,627,163
135	4,627,164
166 R	4,627,165
228	4,627,167
277	4,627,166

CLASS 33

169 C	4,627,169
169 R	4,627,168
181 R	4,627,170
241	4,627,171
366	4,627,172

CLASS 34

10	4,627,173
20	4,627,174
57 A	4,627,175
115	4,627,176

CLASS 36

43	4,627,177
44	4,627,178
	4,627,179

CLASS 37

184	4,627,180

CLASS 38

77.7	4,627,181

CLASS 40

447	4,627,182

CLASS 42

1.01	4,627,183
25	4,627,184
66	4,627,185

CLASS 43

16	4,627,186
17.1	4,627,187
21	4,627,188
55	4,627,189

CLASS 44

40	4,627,854
51	4,627,855

CLASS 47

1 A	4,627,190
25	4,627,191
58	4,627,192

CLASS 49

42	4,627,193

CLASS 51

58	4,627,194
119	4,627,195
281 R	4,627,196
319	4,627,197

CLASS 52

125.5	4,627,198
145	4,627,199
191	4,627,200
208	4,627,201
209	4,627,202
221	4,627,203
233	4,627,204
294	4,627,205
302	4,627,206
361	4,627,207
483	4,627,208
589	4,627,209
646	4,627,210
652	4,627,211
726	4,627,212
745	4,627,213

CLASS 53

246	4,627,215
251	4,627,216
374	4,627,217
399	4,627,218
	4,627,219
414	4,627,220
425	4,627,221
443	4,627,222
449	4,627,223
502	4,627,224
510	4,627,225

CLASS 55

31	4,627,856
70	4,627,857
126	4,627,858
158	4,627,859
162	4,627,860
278	4,627,861
316	4,627,862
354	4,627,863

CLASS 56

14.6	4,627,226
235	4,627,227

CLASS 57

88	4,627,228
213	4,627,229
401	4,627,230

CLASS 59

80	4,627,231
84	4,627,232

CLASS 60

39.161	4,627,233
39.281	4,627,234
415	4,627,235
435	4,627,236
452	4,627,238
484	4,627,239
487	4,627,237
507	4,627,240
656	4,627,241

CLASS 62

3	4,627,242
52	4,627,243
63	4,627,244
157	4,627,245
286	4,627,246
503	4,627,247

CLASS 65

1	4,627,864
3.12	4,627,865
	4,627,866
	4,627,867
6	4,627,868

CLASS 70

134	4,627,248
139	4,627,249
214	4,627,250
276	4,627,251
351	4,627,252

CLASS 71

78	4,627,869
86	4,627,870
92	4,627,871
	4,627,872
93	4,627,873
118	4,627,874

CLASS 72

4	4,627,253
6	4,627,254
10	4,627,255
60	4,627,256
102	4,627,257
196	4,627,258
202	4,627,259
247	4,627,260
	4,627,261
248	4,627,262
298	4,627,263
345	4,627,264
354	4,627,265
444	4,627,266

CLASS 73

3	4,627,267
5	4,627,268
23	4,627,269
38	4,627,270
55	4,627,271
57	4,627,272
61.1 R	4,627,273
64	4,627,274
112	4,627,275
151	4,627,276
170 R	4,627,277
188	4,627,278
195	4,627,279
290 R	4,627,280
302	4,627,281
	4,627,282
313	4,627,283
336.5	4,627,284
430	4,627,285
431	4,627,286
432.1	4,627,288
622	4,627,289
628	4,627,290
634	4,627,291
728	4,627,292
831	4,627,293
861.05	4,627,294
861.24	4,627,295
862.33	4,627,296
862.34	4,627,297
862.36	4,627,298
865.6	4,627,287

CLASS 74

7 A	4,627,299
89.15	4,627,300
333	4,627,301
360	4,627,302
425	4,627,303
469	4,627,304
489	4,627,305
492	4,627,306
552	4,627,307
689	4,627,308
752 C	4,627,309
763	4,627,310
866	4,627,311
	4,627,312
867	4,627,313

CLASS 81

9.43	4,627,314
177.4	4,627,315
430	4,627,316

CLASS 82

1 C	4,627,317

CLASS 83

18	4,627,318
71	4,627,214
73	4,627,319
163	4,627,320
468	4,627,321
831	4,627,322

CLASS 84

1.01	4,627,323
	4,627,324
1.26	4,627,325
94 C	4,627,326

CLASS 89

1.816	4,627,327

CLASS 91

410	4,627,328
506	4,627,329

CLASS 92

12.2	4,627,330
129	4,627,331
168	4,627,332

CLASS 98

56	4,627,333

CLASS 99

306	4,627,334
325	4,627,335
467	4,627,336
485	4,627,337
534	4,627,338
540	4,627,339

CLASS 100

5	4,627,340
41	4,627,341

CLASS 101

25	4,627,342
27	4,627,343
93.14	4,627,344
119	4,627,345
170	4,627,346
292	4,627,347
	4,627,348
348	4,627,349
350	4,627,350

CLASS 102

213	4,627,351
290	4,627,352
307	4,627,353
368	4,627,354
378	4,627,355
453	4,627,356
503	4,627,357

CLASS 104

3	4,627,359
7.2	4,627,358
	4,627,360
23.2	4,627,362
28	4,627,361

CLASS 106

22	4,627,875
27	4,627,876
100	4,627,877
121	4,627,878
124	4,627,879

CLASS 108

90	4,627,363
147	4,627,364

CLASS 110

240	4,627,365
263	4,627,366
347	4,627,367

CLASS 112

83	4,627,368
103	4,627,369
275	4,627,370
451	4,627,371

CLASS 114

61	4,627,372
182	4,627,373
218	4,627,374
230	4,627,375
272	4,627,376
373	4,627,377

CLASS 116

229	4,627,378

CLASS 118

77	4,627,380
721	4,627,379

CLASS 119

1	4,627,381
	4,627,382
	4,627,383
26	4,627,384
29	4,627,385

CLASS 122

1 B	4,627,386
4 D	4,627,387
149	4,627,388

CLASS 123

25 C	4,627,389
41.27	4,627,397
73 CB	4,627,390
90.16	4,627,391
90.39	4,627,392
146.5 A	4,627,393
195 R	4,627,394
216	4,627,395
302	4,627,396
418	4,627,398
419	4,627,399
432	4,627,400
439	4,627,401
440	Re.32,301
	4,627,402
447	4,627,403
492	4,627,404
549	4,627,405
573	4,627,406
634	4,627,407

CLASS 126

21 A	4,627,409
25 A	4,627,410
39 E	4,627,411
41 R	4,627,408
110 B	4,627,412
137	4,627,413
215	4,627,414
299 R	4,627,415
351	4,627,416
369	4,627,417
438	4,627,418

CLASS 127

43	4,627,880

CLASS 128

1 D	4,627,419
1.1	4,627,420
20	4,627,421
71	4,627,422
75	4,627,423
83	4,627,424
92 VY	4,627,425
132 D	4,627,427
132 R	4,627,426
135	4,627,428
156	4,627,429
200.17	4,627,430
201.25	4,627,431
203.15	4,627,432
207.16	4,627,433
303 R	4,627,434
303.1	4,627,435
	4,627,436
334 C	4,627,437
419 P	4,627,439
419 R	4,627,438
682	4,627,440
696	4,627,441
736	4,627,442
748	4,627,443
758	4,627,444
770	4,627,445

CLASS 130

27 Z	4,627,446

CLASS 131

109.1	4,627,447
187	4,627,448
276	4,627,449
282	4,627,450

CLASS 132

11 A	4,627,451
33 R	4,627,452
73	4,627,453
88.7	4,627,454

CLASS 135

25 A	4,627,455

CLASS 136

233	4,628,141
246	4,628,142
253	4,628,143
256	4,628,144

CLASS 137

1	4,627,456
	4,627,457
13	4,627,458
116.5	4,627,459
192	4,627,460
243.1	4,627,461
270	4,627,462
510	4,627,463
516.13	4,627,464
563	4,627,465
625.5	4,627,466
625.6	4,627,467
625.66	4,627,468

CLASS 138

92	4,627,469
93	4,627,470
97	4,627,471
174	4,627,472

CLASS 139

294	4,627,473
452	4,627,474

CLASS 141

107	4,627,475
364	4,627,476

CLASS 142

7	4,627,477

CLASS 144

287	4,627,478

CLASS 148

12 C	4,627,881
14	4,627,882
187	4,627,883

CLASS 152

541	4,627,479

CLASS 156

131	4,627,884
160	4,627,885
361	4,627,886
608	4,627,887

CLASS 162

30.11 4,627,888
158 4,627,889

CLASS 164

369 4,627,480
440 4,627,481
514 4,627,482

CLASS 165

2 4,627,483
4,627,484
8 4,627,485
81 4,627,486
104.26 4,627,487

CLASS 166

51 4,627,488
65.1 4,627,489
4,627,490
126 4,627,491
250 4,627,492
263 4,627,493
274 4,627,494
280 4,627,495
292 4,627,496
308 Re.32,302

CLASS 169

23 4,627,497
42 4,627,498

CLASS 173

43 4,627,499
53 4,627,500

CLASS 174

5 R 4,628,145
52 P 4,628,147
52 PE 4,628,146
4,628,148
68.5 4,628,149
88 C 4,628,150
114 R 4,628,151

CLASS 175

319 4,627,501
320 4,627,502
329 4,627,503

CLASS 177

1 4,627,504
4,627,505
25 4,627,506
211 4,627,507

CLASS 180

9.22 4,627,508
142 4,627,509
148 4,627,510
167 4,627,511
247 4,627,512
249 4,627,513
287 4,627,514

CLASS 181

258 4,627,515

CLASS 182

202 4,627,516

CLASS 187

12 4,627,517
29 R 4,627,518

CLASS 188

1.11 4,627,519
18 R 4,627,520

CLASS 192

2 4,627,521
35 4,627,522
58 B 4,627,523
4,627,524
84 C 4,627,525

CLASS 193

35 A 4,627,526

CLASS 198

335 4,627,527
621 4,627,528
778 4,627,529
799 4,627,530

CLASS 200

51.05 4,628,159
61.45 R 4,628,160
61.47 4,628,161
84 C 4,628,162
144 R 4,628,163
148 A 4,628,164
268 4,628,165
302.1 4,628,166

CLASS 202

235 4,627,890

CLASS 204

1 R 4,627,891
1 T 4,627,892
4,627,893
4 4,627,894
20 4,627,895
37.1 4,627,896
59 R 4,627,897
64 R 4,627,898
95 4,627,899
147 4,627,900
190 4,627,901
192.21 4,627,902
275 4,627,903
298 4,627,904
404 4,627,905
415 4,627,906
4,627,907

CLASS 206

309 4,627,531
4,627,532
328 4,627,533
387 4,627,534
4,627,535
426 4,627,536
501 4,627,537
524.1 4,627,538
597 4,627,539

CLASS 208

58 4,627,908
65 4,627,909
112 4,627,910
120 4,627,911
415 4,627,913

CLASS 209

555 4,627,540
668 4,627,541

CLASS 210

96.1 4,627,914
195.2 4,627,915
488 4,627,916
617 4,627,917
656 4,627,918
4,627,919
668 4,627,920
4,627,921
704 4,627,922
744 4,627,923
760 4,627,924

CLASS 211

150 4,627,542
187 4,627,543
189 4,627,544

CLASS 213

100 R 4,627,545

CLASS 215

100 A 4,627,546
222 4,627,547
295 4,627,548

CLASS 219

10.57 4,628,167
10.81 4,628,168
68 4,628,169
69 D 4,628,170
69 G 4,628,171
4,628,173
69 W 4,628,172
76.13 4,628,174
110 4,628,175
4,628,176
121 LD 4,628,178
121 LH 4,628,179
121 PN 4,628,177
124.01 4,628,180
130.33 4,628,181
130.51 4,628,182
216 4,628,183
312 4,628,184
386 4,628,185
497 4,628,186
505 4,628,187
528 4,628,188
532 4,628,189
4,628,190
535 4,628,191

CLASS 220

1.5 4,627,549
306 4,627,550

CLASS 222

1 4,627,551
14 4,627,552
4,627,553
4,627,554
200 4,627,555
240 4,627,556

CLASS 223

39 4,627,557

CLASS 224

238 4,627,558
329 4,627,559

CLASS 225

66 4,627,560
96 4,627,561

CLASS 227

67 4,627,562
130 4,627,563
152 4,627,564

CLASS 228

107 4,627,565

CLASS 232

1 C 4,627,566

CLASS 235

1 R 4,628,192
375 4,628,193
379 4,628,194
440 4,628,195

CLASS 236

34.5 4,627,567
44 B 4,627,568
49 4,627,569

CLASS 239

90 4,627,570
4,627,571
542 4,627,573
590.5 4,627,574
728 4,627,572

CLASS 241

15 4,627,575
24 4,627,576
30 4,627,577
4,627,578
79.1 4,627,579
101.4 4,627,580
167 4,627,581
236 4,627,582

CLASS 242

45 4,627,583
54 R 4,627,584

CLASS 244

2 4,627,585
3.21 4,627,586
122 R 4,627,587

CLASS 248

163.2 4,627,588
346 4,627,589
351 4,627,590
411 4,627,591
465 4,627,592
561 4,627,593
632 4,627,594

CLASS 249

121 4,627,595

CLASS 250

213 VT 4,628,198
225 4,628,196
227 4,628,197
229 4,628,199
231 SE 4,628,200
237 G 4,628,201
269 4,628,202
334 4,628,203
343 4,628,204
361 R 4,628,205
372 4,628,206
461.1 4,628,207
483.1 4,628,208
492.2 4,628,209
558 4,628,210
578 4,628,211

CLASS 251

129.03 4,627,597
129.07 4,627,596
149.2 4,627,598
334 4,627,599

CLASS 252

8.55 R 4,627,926
8.75 4,627,927
8.8 4,627,925
33 4,627,928
47 4,627,929
49.6 4,627,930
153 4,627,931
194 4,627,932
299.6 4,627,933
522 R 4,627,934
4,627,935
558 4,627,936
631 4,627,937

CLASS 254

124 4,627,600

CLASS 260

239 BC 4,627,938
404 4,627,939
501.11 4,627,940

CLASS 261

109 4,627,941

CLASS 264

1.5 4,627,942
14 4,627,943
29.4 4,627,944
29.5 4,627,945
51 4,627,946
53 4,627,947
56 4,627,948
101 4,627,949
103 4,627,950
109 4,627,951
328.12 4,627,952
518 4,627,953

CLASS 266

212 4,627,601

CLASS 267

182 4,627,602

CLASS 269

32 4,627,603
214 4,627,604

CLASS 271

94 4,627,605
98 4,627,606
122 4,627,607
197 4,627,608
311 4,627,609

CLASS 272

72 4,627,610
77 4,627,611
113 4,627,612
116 4,627,613
117 4,627,614
118 4,627,615
120 4,627,616
4,627,617
122 4,627,618
134 4,627,619

CLASS 273

1 GC 4,627,620
32 B 4,627,621
157 R 4,627,622
328 4,627,623

CLASS 277

12 4,627,624
27 4,627,625

CLASS 279

1 A 4,627,626
19.3 4,627,627
20 4,627,628

CLASS 280

5 D 4,627,629
28.5 4,627,630
154.5 R 4,627,631
276 4,627,632
432 4,627,633
477 4,627,634
602 4,627,635
607 4,627,636
714 4,627,637
779 4,627,638
808 4,627,639

CLASS 281

5 4,627,640

CLASS 283

81 4,627,641
92 4,627,642
102 4,627,643

CLASS 285

3 4,627,644
39 4,627,645
114 4,627,646
189 4,627,647
197 4,627,648

CLASS 290

54 4,628,212

CLASS 292

92 4,627,649
113 4,627,650
229 4,627,652
288 4,627,651

CLASS 294

8.6 4,627,653
106 4,627,654

CLASS 296

65 R 4,627,656
91 4,627,657
100 4,627,658
167 4,627,655

CLASS 297

219 4,627,660
284 4,627,661
313 4,627,662
316 4,627,663
452 4,627,664
488 4,627,659

CLASS 299

79 4,627,665

CLASS 301

125 4,627,666
126 4,627,667

CLASS 303

40 4,627,668
114 4,627,669
115 4,627,670
116 4,627,671

CLASS 307

79 4,628,494
80 4,628,213
296 R 4,628,214
297 4,628,215
451 4,628,218
455 4,628,216
467 4,628,217

CLASS 310

68 D 4,628,219
114 4,628,220
178 4,628,221
313 R 4,628,222
358 4,628,223

CLASS 312

331 4,627,672

CLASS 313

414 4,628,224
631 4,628,225

CLASS 315

102 4,628,226
111.81 4,628,227
169.4 4,628,228
241 P 4,628,229
307 4,628,230

CLASS 318

138 4,628,231
267 4,628,234
284 4,628,232
306 4,628,233
430 4,628,235
558 4,628,236
626 4,628,237
653 4,628,238
685 4,628,239
723 4,628,240
778 4,628,241

CLASS 320

2 4,628,242
4,628,243
48 4,628,244

CLASS 322

32 4,628,245
100 4,628,246

CLASS 323

314 4,628,247
4,628,248
315 4,628,249
317 4,628,250
340 4,628,251

CLASS 324

65 CR 4,628,252
73 R 4,628,253
77 C 4,628,255
77 R 4,628,254
95 4,628,256
142 4,628,257
158 P 4,628,258
208 4,628,259
220 4,628,260
240 4,628,261
309 4,628,262
321 4,628,263
322 4,628,264
329 4,628,265
330 4,628,266
376 4,628,267
418 4,628,268

CLASS 328

120 4,628,269

CLASS 329

50 4,628,270
4,628,271
110 4,628,272

CLASS 330

4.3 4,628,273
9 4,628,274
10 4,628,275
86 4,628,276
110 4,628,277
149 4,628,278
257 4,628,279
259 4,628,280
288 4,628,281

CLASS 331

1 A 4,628,282
68 4,628,283
86 4,628,284
163 4,628,285

CLASS 332

9 R 4,628,286

CLASS 333

137 4,628,287

CLASS 335

166 4,628,288
168 4,628,289
274 4,628,290

CLASS 337

203 4,628,291
204 4,628,292
216 4,628,293
248 4,628,294
354 4,628,295

CLASS 338

3 4,628,296

CLASS 339

14 P 4,627,674
14 R 4,627,673
4,627,675
17 CF 4,627,676
4,627,678
17 M 4,627,677
21 R 4,627,679
22 B 4,627,680
75 P 4,627,681
99 R 4,627,682
128 4,627,683
206 R 4,627,684

CLASS 340

347 DD 4,628,297
347 P 4,628,298
540 4,628,299
542 4,628,300
584 4,628,301
620 4,628,302
661 4,628,303
703 4,628,304
4,628,305
825.00 4,628,306
825.05 4,628,307
825.43 4,628,308
825.5 4,628,311
825.54 4,628,309
825.640 4,628,312
825.72 4,628,310
870.02 4,628,313
870.24 4,628,314
870.26 4,628,315
870.38 4,628,316
903 4,628,317

CLASS 342

16 4,628,320
26 4,628,318
46 4,628,319
379 4,628,321

CLASS 343

702 4,628,322
765 4,628,323
788 4,628,324

CLASS 346

1.1 4,628,325
29 4,628,326
33 ME 4,628,327
74.4 4,628,328
75 4,628,329
4,628,330
4,628,331
140 R 4,628,332
4,628,333
4,628,334
208 4,628,335
209 4,628,336

217 4,628,337

CLASS 350

6.8 4,627,685
96.20 4,627,686
4,627,687
173 4,627,688
362 4,627,689
421 4,627,690
429 4,627,691
432 4,627,692
523 4,627,693

CLASS 351

214 4,627,694

CLASS 352

72 4,627,695

CLASS 353

110 4,627,696

CLASS 354

77 4,627,697
317 4,627,698
400 4,627,699
409 4,627,700

CLASS 355

-3 BE 4,627,702
3 CH 4,627,701
3 R 4,627,703
4,627,704
4 4,627,705
14 FU 4,627,714
14 R 4,627,707
4,627,708
4,627,710
4,627,712
4,627,713
4,627,715
14 SH 4,627,706
4,627,709
4,627,711
15 4,627,716
4,627,717
35 H 4,627,718
41 4,627,719
57 4,627,720
77 4,627,721

CLASS 356

4.5 4,627,722
5 4,627,723
141 4,627,724
152 4,627,725
336 4,627,726
338 4,627,727
345 4,627,728
347 4,627,729
349 4,627,730
4,627,731
350 4,627,732
359 4,627,733
376 4,627,734

CLASS 357

15 4,628,338
4,628,339
42 4,628,340
4,628,341
84 4,628,343

CLASS 358

10 4,628,342
12 4,628,344
13 4,628,345
28 4,628,346
39 4,628,347
4,628,348
67 4,628,349
75 4,628,350
93 4,628,351
4,628,352
107 4,628,353
109 4,628,354
111 4,628,355
4,628,356
4,628,357
121 4,628,358
122 4,628,359
139 4,628,360
153 4,628,361
174 4,628,362
183 4,628,363
213 4,628,364
245 4,628,365
280 4,628,366
285 4,628,367
293 4,628,368
314 4,628,369

CLASS 360

15 4,628,370
38.1 4,628,371
40 4,628,372
62 4,628,373
66 4,628,374
71 4,628,375
4,628,376
72.1 4,628,377
77 4,628,378
4,628,379
78 4,628,380
93 4,628,381
4,628,382
96.5 4,628,383
97 4,628,384
99 4,628,385
104 4,628,386
121 4,628,387
128 4,628,388
132 4,628,389
137 4,628,390

CLASS 361

2 4,628,392
3 4,628,393
18 4,628,395
56 4,628,394
91 4,628,396
98 4,628,397
120 4,628,398
4,628,399
172 4,628,400
178 4,628,401
218 4,628,402
283 4,628,403
321 4,628,404
4,628,405
386 4,628,406
388 4,628,407
395 4,628,408
403 4,628,409
413 4,628,410
414 4,628,411
415 4,628,413
424 4,628,412

CLASS 362

32 4,628,416
61 4,628,414
4,628,415
74 4,628,417
116 4,628,418
145 4,628,419
208 4,628,420
238 4,628,421
240 4,628,422
341 4,628,423
351 4,628,424

CLASS 363

10 4,628,425
17 4,628,426
21 4,628,428
4,628,429
25 4,628,430
27 4,628,427
49 4,628,431
56 4,628,432
65 4,628,433
134 4,628,438

CLASS 364

130 4,628,434
4,628,435
131 4,628,436
4,628,437
138 4,628,439
140 4,628,440
167 4,628,441
4,628,442
4,628,499
184 4,628,443
188 4,628,444
200 4,628,445
4,628,446
4,628,447
4,628,448
4,628,449
4,628,450
4,628,451
405 4,628,452
424 4,628,453
4,628,454
434 4,628,455
449 4,628,456
464 4,628,457
474 4,628,458
475 4,628,459
480 4,628,460
481 4,628,461
494 4,628,462
497 4,628,463
513 4,628,464
521 4,628,465
4,628,466
4,628,467
556 4,628,468
560 4,628,469
567 4,628,470
578 4,628,471
759 4,628,472
822 4,628,473
825 4,628,474
851 4,628,475
900 4,628,476
4,628,477
4,628,478
4,628,479
4,628,480
4,628,481
4,628,482
4,628,483

CLASS 365

52 4,628,484
122 4,628,485
149 4,628,486
185 4,628,487
222 4,628,488
230 4,628,489

CLASS 366

265 4,628,391
329 4,627,735

CLASS 367

1 4,628,490
45 4,628,491
63 4,628,492
79 4,628,493
85 4,628,495
93 4,628,496

CLASS 368

88 4,627,736
239 4,627,737
281 4,627,738
282 4,627,739

CLASS 369

44 4,628,497
77.1 4,628,498
249 4,628,500

CLASS 370

3 4,628,501
84 4,628,502
85 4,628,503
4,628,504
4,628,505
104 4,628,506

CLASS 371

5 4,628,507
9 4,628,508
21 4,628,509
4,628,510
22 4,628,511
68 4,628,512

CLASS 372

3 4,628,513
36 4,628,514
107 4,628,515

CLASS 373

72 4,628,516

CLASS 374

1 4,627,740
104 4,627,741
109 4,627,742
122 4,627,743
175 4,627,744
183 4,627,745

CLASS 375

40 4,628,517
88 4,628,518
110 4,628,519

CLASS 376

216 4,627,954
4,627,955
272 4,627,956
412 4,627,957

CLASS 377

6 4,628,520
24 4,628,521

CLASS 378

132 4,628,522
193 4,628,523
197 4,628,524

CLASS 379

10 4,628,158
51 4,628,152
163 4,628,153
410 4,628,156
4,628,157

CLASS 381

26 4,628,525
57 4,628,526
69.2 4,628,527
90 4,628,528
94 4,628,529
103 4,628,530
156 4,628,155
189 4,628,154

CLASS 382

8 4,628,531
21 4,628,532
27 4,628,533
41 4,628,534

CLASS 383

24 4,628,535
75 4,628,536

CLASS 384

99 4,627,746
113 4,627,747

CLASS 400

17 4,627,748
121 4,627,749
144.2 4,627,750
4,627,751
4,627,752
174 4,627,753
649 4,627,754
662 4,627,755

CLASS 401

94 4,627,756
194 4,627,757
208 4,627,758

CLASS 403

2 4,627,759
201 4,627,760
324 4,627,761
369 4,627,762

CLASS 404

6 4,627,763
41 4,627,764

CLASS 405

146 4,627,765
195 4,627,766
196 4,627,767
198 4,627,768
256 4,627,769

CLASS 407

21 4,627,770
39 4,627,771

CLASS 409

121 4,627,772
215 4,627,773

CLASS 411

5 4,627,774
34 4,627,775
179 4,627,776
439 4,627,777

CLASS 414

17 4,627,779
346 4,627,780
412 4,627,781
491 4,627,782
517 4,627,783
540 4,627,784
730 4,627,785
735 4,627,786
786 4,627,787

CLASS 415

11 4,627,788
28 4,627,789
53 R 4,627,790

CLASS 416

132 R 4,627,791

CLASS 417

83 4,627,792
203 4,627,793
225 4,627,794
267 4,627,795
313 4,627,796
411 4,627,797
415 4,627,798

CLASS 418

55 4,627,799
4,627,800
61 B 4,627,801
185 4,627,802

CLASS 419

8 4,627,958
61 4,627,959

CLASS 420

472 4,627,960
564 4,627,961

CLASS 422

40 4,627,962
125 4,627,963

CLASS 423

228 4,627,964
242 4,627,965
263 4,627,966
300 4,627,967
329 4,627,968
478 4,627,969
555 4,627,970

CLASS 424

15 4,627,971
44 4,627,972
47 4,627,973
48 4,627,974
49 4,627,975
4,627,976
52 4,627,977
54 4,627,978
4,627,979
4,627,980
84 4,627,981
95 4,627,982

CLASS 425

6 4,627,803
71 4,627,804
72 R 4,627,805
72 S 4,627,811
83.1 4,627,806
116 4,627,807
270 4,627,808
555 4,627,809
577 4,627,810

CLASS 426

7 4,627,983
37 4,627,984
92 4,627,985
112 4,627,986
548 4,627,987

CLASS 427

5 4,627,988
10 4,627,989
4,627,990
39 4,627,991
244 4,627,992

CLASS 428

36 4,627,993
41 4,627,994
43 4,627,995
104 4,627,996
216 4,627,997
285 4,627,998
326 4,627,999
341 4,628,000
367 4,628,001
4,628,002
377 4,628,003
413 4,628,004
432 4,628,005
446 4,628,006
542.8 4,628,007
694 4,628,009

CLASS 429

19 4,628,010
49 4,628,011
53 4,628,012
111 4,628,013
113 4,628,014
194 4,628,015

CLASS 430

30 4,628,016
48 4,628,017
59 4,628,018
106.6 4,628,019
165 4,628,020
203 4,628,021
280 4,628,022
331 4,628,023
376 4,628,024
533 4,628,025

CLASS 431

7 4,627,812

CLASS 432

24 4,627,815
60 4,627,813
128 4,627,814

CLASS 433

11 4,627,816
152 4,627,817

CLASS 434

236 4,627,818
337 4,627,819

CLASS 435

7 4,628,026
4,628,027
95 4,628,028
99 4,628,029
101 4,628,030
205 4,628,031
240 4,628,032
255 4,628,033

CLASS 436

55 4,628,034
518 4,628,035
520 4,628,036
526 4,628,037

CLASS 441

64 4,627,820
83 4,627,821
92 4,627,822
95 4,627,823

CLASS 445

27 4,627,824

CLASS 448

548 4,628,008

CLASS 455

34 4,628,537
91 4,628,538
194 4,628,539
197 4,628,540
603 4,628,541
619 4,628,542

CLASS 464

2 4,627,825
171 4,627,826

CLASS 474

80 4,627,827
205 4,627,828

CLASS 493

189 4,627,829
316 4,627,830
337 4,627,831

CLASS 501

35 4,628,038
97 4,628,039

CLASS 502

9 4,628,040
24 4,628,041
263 4,628,042

CLASS 514

12 4,628,043
15 4,628,044
17 4,628,045
33 4,628,046
34 4,628,047
63 4,628,048
147 4,628,049
167 4,628,050
170 4,628,051
171 4,628,052
222 4,628,053
234 4,628,054
249 4,628,055
270 4,628,056
292 4,628,057
383 4,628,058
384 4,628,059
432 4,628,060
469 4,628,061
569 4,628,062
626 4,628,063
654 4,628,064

CLASS 518

700 4,628,065
4,628,066

CLASS 521

25 4,628,067
57 4,628,068

CLASS 524

339 4,628,069
504 4,628,070
832 4,628,071

CLASS 525

57 4,628,072
70 4,628,073
146 4,628,074
403 4,628,075
440 4,628,076

CLASS 526

90 4,628,077
303.1 4,628,078

CLASS 528

49 4,628,079
88 4,628,080
176 4,628,081

CLASSIFICATION OF PATENTS

CLASS 534

707	4,628,082
798	4,628,083

CLASS 540

509	4,628,084
539	4,628,085

CLASS 544

31	4,628,086
41	4,628,087
224	4,628,088
244	4,628,089
258	4,628,090
339	4,628,091
351	4,628,092

CLASS 546

6	4,628,093
186	4,628,094
234	4,628,095
250	4,628,096
251	4,628,097
271	4,628,098
302	4,628,099
304	4,628,100

CLASS 548

200	4,628,101
218	4,628,102
266	4,628,103
341	4,628,104
	4,628,105
440	4,628,106

CLASS 549

23	4,628,107
453	4,628,108

CLASS 560

13	4,628,109
119	4,628,110
159	4,628,111
160	4,628,112
232	4,628,113
	4,628,114

CLASS 562

464	4,628,115
513	4,628,116
577	4,628,117
602	4,628,118

CLASS 564

314	4,628,119

CLASS 568

322	4,628,120
487	4,628,121
492	4,628,122
634	4,628,123
726	4,628,124
730	4,628,125
771	4,628,126
781	4,628,127
864	4,628,128
	4,628,129
885	4,628,130
937	4,628,131

CLASS 585

4	4,628,132
310	4,628,133
331	4,628,134
	4,628,135
441	4,628,136
445	4,628,137
531	4,628,138
	4,628,139
606	4,628,140

CLASS 604

9	4,627,832
29	Re.32,303
34	4,627,833
49	4,627,834
67	4,627,835
93	4,627,836
101	4,627,837
105	4,627,838
121	4,627,839
151	4,627,840
158	4,627,841
177	4,627,842
263	4,627,843
264	4,627,844
295	4,627,845
349	4,627,846
366	4,627,847
370	4,627,848
379	4,627,849
892	4,627,850
	4,627,851
897	4,627,852

CLASS 623

16	4,627,853

CLASS 708

139	4,627,912

CLASSIFICATION OF DESIGNS

D2—	187	287,060
	246	287,061
	258	287,062
	314	287,063
	315	287,064
	320	287,065
	323	287,066
D3—	35	287,068
		287,069
		287,070
	37	287,071
D4—	104	287,072
	105	287,073
D6—	330	287,074
	349	287,075
	386	287,076
	390	287,077
	436	287,079
	446	287,080
	450	287,078
	457	287,081
	491	287,082
	502	287,083
	510	287,084
	513	287,085
D7—	9	287,086
	39	287,087
	53	287,088
	309	287,089
	323	287,090
	337	287,091
	361	287,092
D8—	34	287,093
	49	287,094
	91	287,095
	102	287,096
	382	287,097
	388	287,098
	394	287,099
	395	287,100
		287,101
	499	287,102
D9—	352	287,103
	415	287,105
	425	287,104
D10—	114	287,106
	121	287,107
D11—	4	287,108
		287,109
	158	287,110
	218	287,067
D12—	6	287,111
	84	287,112
	97	287,113
	181	287,114
	190	287,115
		287,116
D13—	12	287,117
	13	287,118
	21	287,119
	23	287,120
		287,121
	25	287,122
	29	287,123
D14—	53	287,124
	55	287,125
	57	287,126
		287,127
D15—	1	287,128
	5	287,129
		287,130
	16	287,131
	19	287,132
	81	287,133
	122	287,134
	144	287,135
D16—	132	287,136
D17—	20	287,137
D18—	1	287,138
	7	287,139
	12	287,140
D19—	43	287,141
	75	287,142
D20—	6	287,143
D21—		287,144
	13	287,145
	24	287,146
	43	287,147
	65	287,148
		287,149
	128	287,150
	148	287,151
		287,152
	150	287,153
	166	287,154
	185	287,155
	255	287,156
D22—	107	287,157
	111	287,158
D23—	21	287,159
	25	287,160
	28	287,161
		287,162
		287,163
	29	287,164
	138.3	287,167
D24—	51	287,165
		287,166
D28—	77	287,168
	83	287,169
D30—	12	287,170
D32—	25	287,171
	41	287,172
	51	287,173
	54	287,174
	55	287,175
D34—	9	287,176
	21	287,177
	24	287,178
	31	287,179

CLASSIFICATION OF PLANTS

P.—	20	5,820
	42	5,821
	47	5,822
		5,823
		5,824
	68	5,825
		5,826

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OF RESIDENCE OF INVENTORS

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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01 : 4,627,595	4,627,558	4,628,195	4,628,185	4,627,212	4,627,655
4,627,798	4,627,561	4,628,216	4,628,206	4,627,431	4,628,004
4,628,027	4,627,569	4,628,230	4,628,213	16 : 4,627,293	4,628,074
4,628,089	4,627,573	4,628,252	4,628,327	4,627,541	4,628,081
4,628,177	4,627,587	4,628,265	4,628,353	4,628,221	4,628,088
02 : 4,627,496	4,627,610	4,628,273	4,628,362	17 : 4,627,111	4,628,236
04 : 4,627,267	4,627,621	4,628,277	4,628,457	4,627,120	4,628,539
4,627,381	4,627,643	4,628,299	4,628,476	4,627,130	19 : 4,627,206
4,627,425	4,627,659	4,628,339	4,628,532	4,627,150	4,627,330
4,627,611	4,627,702	4,628,380	10 : 4,627,194	4,627,157	4,627,745
4,627,841	4,627,730	4,628,392	4,627,271	4,627,180	4,628,318
4,627,963	4,627,738	4,628,400	4,627,873	4,627,199	20 : 4,627,125
4,627,988	4,627,740	4,628,405	4,627,974	4,627,203	4,627,146
4,628,214	4,627,754	4,628,410	4,627,975	4,627,237	4,627,590
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4,628,248	4,627,773	4,628,420	4,627,978	4,627,321	21 : 4,627,143
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4,628,489	4,627,780	4,628,449	4,627,980	4,627,382	4,627,462
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06 : Re.32,302	4,627,794	4,628,466	4,628,096	4,627,408	4,627,886
4,627,115	4,627,819	4,628,473	11 : 4,627,241	4,627,453	4,628,443
4,627,121	4,627,839	4,628,513	12 : 4,627,375	4,627,538	22 : 4,627,188
4,627,159	4,627,850	4,628,519	4,627,439	4,627,672	4,627,200
4,627,166	4,627,851	4,628,523	4,627,440	4,627,735	4,627,922
4,627,167	4,627,853	4,628,538	4,627,692	4,627,810	4,627,967
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4,627,193	4,627,898	4,627,273	4,627,829	4,627,891	23 : 4,627,195
4,627,198	4,627,904	4,627,294	4,627,832	4,627,931	4,627,277
4,627,234	4,627,906	4,627,547	4,627,840	4,627,994	4,627,616
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4,627,256	4,627,909	4,627,657	4,627,995	4,628,186	24 : 4,627,132
4,627,268	4,627,910	4,627,666	4,628,063	4,628,205	4,627,355
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4,627,339	4,627,982	09 : 4,627,113	4,628,272	4,628,374	4,627,724
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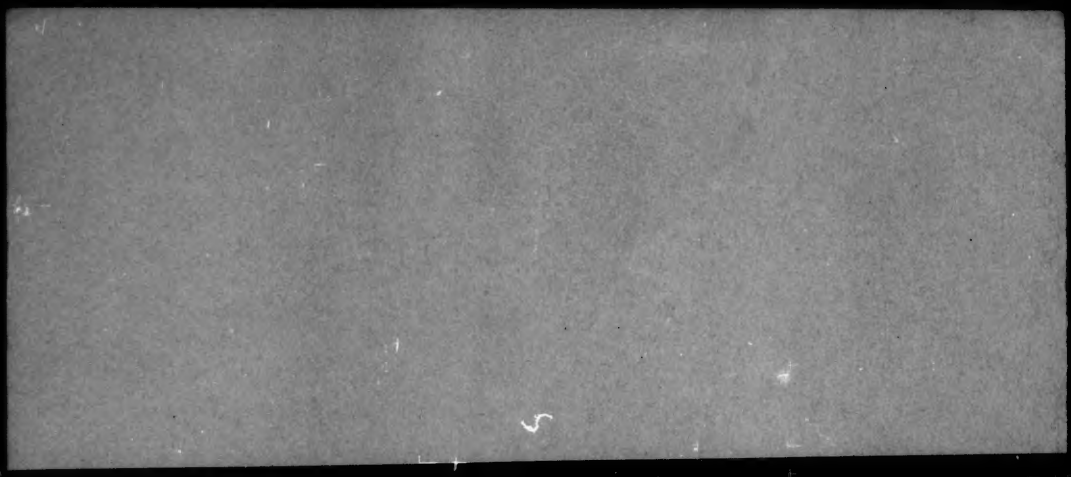

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